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NEWSPAPER

NEWS IN BRIEF

Memory Prices Cut On Burroughs Units

By Toni Wiseman
Of the CW Staff

DETROIT – Burroughs Corp. has reduced prices on all main memory modules for its medium-scale B2800, B3800 and B4800 systems.

Reductions for purchased memory range from 19% to 37% and from 8% to 21% for leased modules.

Burroughs has also increased main memory capacities for the B2800 and B3800 from the current 500K bytes to 1M bytes of MOS memory, the firm said.

The B4800 already has expansion capability to 1M bytes of bipolar memory.

The price reductions are the result of "significant reductions in the cost of MOS and bipolar memory circuits," according to the firm.

Memory for the B2830 and B3830 is in increments of 50K bytes from 150K- to 400K bytes; 100K byte increments are from 400K- to 500K bytes.

All memory increments for the B2830 and B3830 are in 250K byte modules from 500K- to 1M bytes.

All 4840 memory increments are in

(Continued on Page 4)

Maintenance Hikes Hit Honeywell Users

WALTHAM, Mass. – Honeywell Information Systems has announced 7% to 15% maintenance price increases on HIS and Xerox Corp. systems.

The company also announced a 2.5% price boost on its rented series 200 and 2000 and leased Xerox equipment.

Reductions in maintenance charges ranging from 5% to 25% will be made on certain series 60, 6000, 200 and 2000 items, the company said.

Xerox price increases will be made under a Jan. 31 power of attorney from Xerox to HIS, it added.

HIS cited rising costs and the continued effects of inflation as reasons for the changes

The price adjustments were effective for new business on Sept. 1. For existing contracts, the changes will be implemented Jan. 1, 1977 for HIS rental agreements and Dec. 1 for maintenance and Xerox agreements.

Price protection provisions in some contracts will limit the amount of some increases, as HIS spokeswoman said.

Prices will be raised 9% for maintenance of most HIS equipment, she added.

The increase will affect most series 16,

(Continued on Page 4)

Under Judge's Plan

U.S. and IBM Agree to Speed Up Case

By Edith Holmes
Of the CW Staff

NEW YORK – The U.S. government and IBM agreed to a proposal by Judge David N. Edelstein here last week that the parties and court alike hope will expedite the now 15-month-old antitrust trial "considerably."

The judge, who is hearing the case without a jury, suggested the government cease reading portions of the depositions of key IBM officials and of the corporation's internal documents into the record.

He recommended that the government attorneys simply offer the document or deposition, after its description, as evidence against IBM and that IBM counsel object where they feel objections are necessary.

The court reporters who transcribe the proceedings daily will then simply retype those portions of the exhibits which the parties would have read directly into the record, the judge said.

The procedure the parties have followed to date called for reading aloud in open court those parts of depositions and documents which the government and IBM felt deserved particular emphasis.

Depositions, in particular, have taken days of trial time in the past, and both sides anticipate saving these newly acquired hours before the court for pushing on with the already lengthy proceedings.

Last week, however, no one could estimate just how much time will be saved.

The script calling for reading everything into the record became particularly questionable when, seven weeks ago, Edelstein walked off the bench and made himself available to the government and IBM from his chambers while the attorneys continued their presentation of document and deposition material in Courtroom 110 at the federal courthouse in Foley Square here.

After eliciting a variety of "contempt of clerk" jokes, the judge's absence led to the conclusion by nearly all concerned with the case that the procedure for handling these exhibits was, in the words of one attorney, "a patent waste of court time."

But while lawyers for both sides chafed under this procedure, they have continued it throughout the Justice Department presentation and up through the current "fighting machines" or "product announcements" part of the government's suit, because they believed the judge ordered the material be read in open court during a conference held before the trial actually began in May 1975.

Both sides had suggested other approaches for putting deposition and document testimony into evidence. For one reason or another, each of these ideas failed to win the unanimous approval of those concerned prior to the start of the trial.

(Continued on Page 2)

Responsibility of DPers Cited In Keeping U.S. Cities Alive

By John P. Hebert
Of the CW Staff

ATLANTA – DPers in urban and regional government must shoulder the great responsibility of keeping the declining American city alive, according to Jules Sugarman, chief administrative officer of the city of Atlanta.

Speaking at the keynote session of the Urban Regional Information Systems Association (Urisa '76) conference here last week, Sugarman said the prime responsibility of urban DP and support personnel is "to make sure, when legislation is enacted, it is done with a realistic relation to available, timely data.

More coverage of the Urisa '76 conference follows on Pages 5 and 6.

"Public leaders often steer very blindly in what they do" because of a lack of information or outdated information, Sugarman told the conference attendees.

'Business of Judgement'

Despite the desire for simplicity on the part of elected officials, "the business of government is a business of judgement not clear-cut facts and alternatives." This is where there is a need for the DPer as information specialist, he said.

DPers must engage in providing timely, accurate and full information in order to help elected officials base their decisions on facts to promote, what he called, "the quality of urban living."

As managers of government and consumers of the information systems, elected officials are appalled at the length of time it takes to get information. If they don't have the information, he said, the blame for the inability to make decisions is placed on the information processors.

A second problem, Sugarman cited, was the knowledge of how to use consultants. "Organizations must develop the internal capacity to manage and utilize consultants to produce what the government wants them to produce," he added.

A third pressing problem is the need to

(Continued on Page 2)

'Idea' Software Drives DG Mini In Transaction Processing Uses

By Esther Surden
Of the CW Staff

SOUTHBORO, Mass. – The most important feature in last week's introduction of the Eclipse C/330, which extends Data General Corp.'s (DG) line of superminis upward, is the announcement of Interactive Data Entry and Access (Idea) software designed for commercial transaction driven applications.

The Idea software is said to allow data entry access and inquiry functions to be developed more quickly than with traditional programming methods, according to a DG spokesman.

To place the system in the distributed processing arena, the company also introduced RJE80 software which allows DG computers to emulate both IBM 2780 or 3780 remote job entry terminals and to communicate with IBM hosts or each other.

A 600 line/min printer was also announced.

In the range of the Digital Equipment Corp. PDP-11/70 or the Hewlett-Packard 3000 Series II, the system with Idea software can accommodate up to 16 terminals running concurrent programs, the firm said. It is designed for banking, insurance, credit, warehouse, dealership, hospital management, education and manufacturing applications,, the spokesman noted.

Can Upgrade to C/330

Eclipse C/300 users can upgrade to the C/330 for a $2,000 field engineering charge, in addition to the cost of the additional necessary hardware, DG said.

(Continued on Page 4)

In Union Victory

Postal Service Route Plan Halted

By John P. Hebert
Of the CW Staff

WASHINGTON, D.C. – The financially beleaguered U.S. Postal Service (USPS) saw its computerized work measurement system, tested on letter carriers in Indiana and Oregon, come to a halt recently as standard mail delivery was resumed

The final showdown between USPS and the National Association of Letter Carriers (Nalc) over the "Kokomo Plan" took place last month with a final decision handed down by an impartial labor dispute arbitrator, Sylvester Garrett.

The verdict followed Garrett's interim decision in July which halted "excessive" overtime that had resulted in some areas from implementation of computer-selected route assignments for carriers [CW, July 19].

Garrett was recently persuaded by additional arguments made on the behalf of Nalc (in some cases by physicians) that the USPS "cannot make robots of letter carriers," according to James Rademacher, president of the letter carrier union.

If all people were the same, Rademacher said, the USPS could use a standard program calculated by computers to set car-

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Sanders Protest Reverses Lease Award

By Ronald A. Frank

Of the CW Staff

CONCORD, N.H. – A protest by Sanders Associates, Inc. has resulted in the State of New Hampshire reversing a $375,000 terminal lease award and a rebuke of the state DP chief by the governor and Executive Council.

Sanders initiated the protest after the Department of Centralized Data Processing (CDP) had awarded a CRT terminal lease to Honeywell Information Systems.

The contract called for 41 CRTs to be used by the Division of Welfare to determine the eligibility of applicants for benefits.

Sanders claimed that Jerald Nelson, CDP director, had illegally modified bidding specifications in order to award the lease to Honeywell. Sanders said Nelson and state purchasing director Richard Peale had extrapolated a four-year lease rate bid by Sanders into an incorrect five-year rate without notifying Sanders.

In addition, the Nashua, N.H. supplier said that state specifications had called for 98% uptime standards and this had been changed to 90% uptime, also without notifying Sanders.

Honeywell had bid nonprogrammable terminals for the welfare system while Sanders proposed programmable units to do the job. Even with the more sophisticated CRTs, Sanders said its price would have been lower than Honeywell's if the state had asked for a five-year rate.

In a letter sent to Peale by Norman Marsh, assistant corporate counsel, Sanders said it could save the state $5,000 and it called for arbitration of the matter by Governor Meldrim Thomson and the Executive Council.

At a meeting of the governor and council late last month, Nelson said Honeywell had been awarded the contract because Sanders had not met certain requirements on another state contract. Nelson also said Sanders had been disqualified because he felt a programmable terminal was not needed.

When asked why the specifications had not called out the exact type of terminal required, Nelson said such specifications would have illegally excluded a particular vendor.

It was brought out that Sanders actually had been the only bidder that did not deviate from written specifications. Thomson warned both Peale and Nelson that he will insist on clear and tight specifications to be adhered to in the future. He said CDP should draw up specifications that are not later changed.

A vote by the Executive Council rescinded the earlier Honeywell award and gave the contract to Sanders. The programmable terminals cost CDP $374,953 compared with the Honeywell price of $378,583. A Honeywell spokesman said his company would have no comment to make on the situation.

U.S., IBM Agree to Speed Case Under Judge's Proposed Plan

(Continued from Page 1)

Observers in court speculated Edelstein may have absented himself from the daily proceedings to give the parties time and cause to think about what pieces of evidence are really necessary to their respective cases. He has repeatedly asked the government and IBM to give him some idea of the weight he should give to this deposition or that document.

But whatever his reasons for following the procedure of the last several weeks, the judge has decided it isn't working. In the robing room conference in which he proposed the new procedure to the parties, Edelstein said he hoped it would "move us along more rapidly without any sacrifice of time."

Government attorney Charles E. Hamilton III, who has overall responsibility for the "fighting machines" portion of the case on IBM's marketplace conduct, said he thought the judge's suggestion would apply to the balance of the trial, including IBM's presentation of its defense, and anticipated it will "streamline" the case considerably.

The new procedure "will cut down substantially on trial time," Hamilton added, noting it will have particular effect where depositions are concerned. "Most of the document readings have not been that extensive," he said, so their elimination won't save that much time.

"It is my judgment that the changes Judge Edelstein announced in his discontinuance of the deposition and document readings should materially expedite the trial of this case," IBM counsel Robert F. Mullen stated.

What he meant by "materially," Mullen couldn't say. He added he had no sense of why the judge changed the procedure at this point in the trial other than "to expedite" the proceedings.

Responsibility of DPers Cited

(Continued from Page 1)

deliver the information in an intelligent manner on a computer printout, he continued. What this means, he said, is the employment of effective data transfer systems to achieve intelligibility of the data by the city administration.

Intelligible Information Needed

The great importance of this need for intelligible information can be seen in light of the fact the elected officials are reporting directly to the citizen, he implied.

Finally, DPers, as information specialists, "must have an awareness that they work in a political process and they are really a significant part of a city's administrative machinery," he said.

The DP professional must work with his colleagues to develop a simple, intelligent product of that machinery and must work with politicians to effect that goal.

He hastened to add, however, there is a responsibility of the political leadership to become aware themselves of DP needs and capabilities.

On a national level, he added, there is the same need to become more realistic and informed about information systems.

But the primary responsibility falls on the provider of information, whose job is a crucial one and not without headaches, he said.

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THANKS!

At this year's "Sorting Olympic" tryouts, IBM provided everything but the winner!

(Even the MF-1 "stopwatch" and a qualified observer.)

Call (201) 568-9700

We're never out of sorts.

Ah, it's a real pleasure to compete against IBM's software division. Take the recent tryouts for the "Sorting Olympics of 1976," for example.

First, IBM graciously agreed to participate in a new series of MVS sorting trials. Our SyncSort III-and-half would be matched against their SM1-5734 and SM1-5740 (PEER/ICEMAN). All three would be run on exactly the same live data — the files of a cooperating major data-processor. May the best sort win!

Next, just to make certain that everything was really on the up and up, IBM dispatched one of their technical people to serve as their representative.

Then IBM did the finest thing of all. They sent their own "stopwatch." This was an MF-1 monitor, designed especially to evaluate systems performance on MVS. It was, they told us, accurate as a pawnbroker's eye. That was fine with us. We're scientists, too.

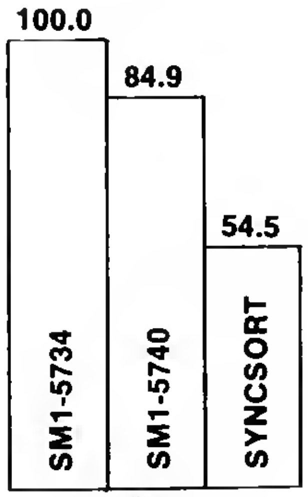
Finally, the moment of truth came. The tests were run . . . the observers gathered round to examine the still smoking results . . . and guess what?

SyncSort III-and-half won everything! IBM's MVS/MF-1 said so. And who are we to argue?

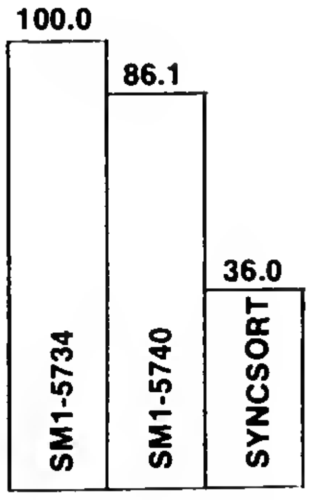
The results are pictured below. Please remember that in a "sorting olympics" the winner always stands on the lowest platform. And that's where SyncSort stood all day while the Whitlow anthem was played again and again.

OVERSEAS REPRESENTATIVES —

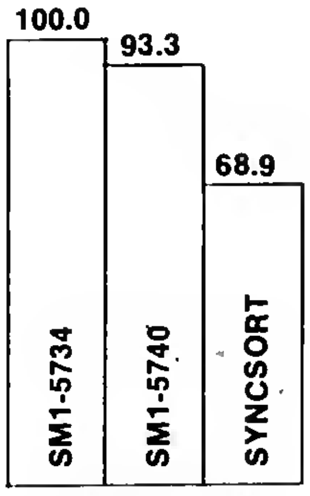
London, Paris, Dusseldorf, Brussels — (Gemini Computer Systems), Rijswijk (ZH) — (PANDATA), Madrid — (Entel/Ibermatica), Vienna — (Ratio), Sao Paulo — (Dellacom Do Brasil), Melbourne — (The Shell Company of Australia, Limited),



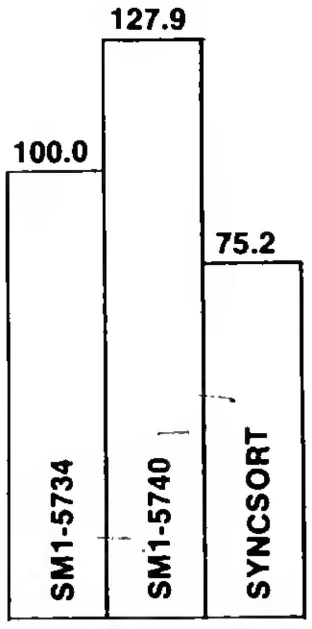
ELAPSED TIME



DISK KILOBYTE MINUTES



CHANNEL TIME (FROM MF-1)



TOTAL CPU TIME (TCB & SRB FROM MF-1)

Should IBM be discouraged? Not in the least. The difficulty is that the computer giant is competing in the wrong events. Maybe he ought to stick to events where weight and muscle are prime requisites for success. The hardware throw, for example.

WHITLOW COMPUTER SYSTEMS Inc. 560 Sylvan Ave., Englewood Cliffs, N.J. 07632

U.S. vs. IBM Government Witness List Updated

By Edith Holmes

Of the CW Staff

NEW YORK – Wanna know who's gonna be on the stand for the rest of the trial of the U.S. government's antitrust suit against IBM here? I'll tell ya.

The Justice Department essentially retyped its old witness list from last September and referred IBM counsel and the court to its pretrial brief available since Oct. 17, 1974.

The document was generated in response to a recent IBM motion asking Judge David N. Edelstein to order the government to produce an updated list and a revised schedule for the remainder of its case.

To be sure, there are differences between the witness list issued Sept. 19, 1975 and the one put on Aug. 9. Twenty-five names on last fall's list are no longer there.

Five people were dropped from the bundling part of the government's case and another, from the third phase of the conduct portion of the suit – educational allowances.

Six who were scheduled to appear in U.S. vs. IBM also testified in Telex vs. IBM and portions of their testimony from that trial will be read into the record in lieu of live questioning.

In its list of nearly a year ago, the Justice Department also had included its staff economists. Their names are no longer on the list, although the government plans to have them take the stand at the end of its courtroom presentation nonetheless.

Additions have been made to the witness list as well as deletions.

Two of these people, C. Peter McColough and Wallace B. Askins, are from Xerox Corp., bringing to a total of four the number of top Xerox executives who have come to court to tell the story of that company's exit from the computer field.

The third addition is Gordon R. Brown, a senior vice-president in charge of marketing and planning for Control Data Corp., who may be a major witness since he is scheduled for two days of trial time while the average time the government expects to keep people on the stand is half a day.

None of the government's estimates of the trial time per witness that it plans to spend have changed; the Justice Department continued to note it has no way of knowing how much additional time IBM will take to put these people through cross-examination.

While there was some talk of calling executives from Singer Corp. to the stand to tell the court why that company split the computer mainframe scene late last summer, there isn't anyone from Singer on the new witness list.

Other Changes Made

The only other changes between the "old" and "new" lists appear to be some reordering of who will testify and when. In particular, Memorex Corp. and California Computer Products, Inc. (Calcomp) people have moved up the list to follow those testifying in the government's presentation on IBM's alleged setting of de facto industry standards.

Otherwise, the government's witness list at this point in the trial breaks down as follows:

- Felix Kaufman of Coopers & Lybrand, Frederic G. Withington of Arthur D. Little, Inc. and Philip A. Friend of Optimum Systems, Inc. have yet to testify on the computer industry and its marketplace in general.
- Robert D. Schmidt, executive vice-president with CDC, is the only witness scheduled for the "fighting machines" or "product announcements" part of the conduct phase of the government's case now underway and projected to last at least until mid-October.
- Two people will be called as witnesses in the educational allowances portion of the government's suit – one from M.I.T. and the other from Stanford University.
- At least four people – from Honeywell Information Systems, CDC, NCR and the General Services Administration – are slated to testify in the standards area.
- Some 20 people from several peripheral and small mainframe makers are on the government witness list and they represent such firms as Memorex Corp., Calcomp, Storage Technology Corp., Advanced Memory Systems, Electronic Memories and Magnetics Corp., Cambridge Memories, Inc., Wang Laboratories, Inc., Itel Corp., Sanders Associates, Inc. and Datapoint Corp.
- Another 20 witnesses appear to be slated to testify in the portion of the government's case dealing with financing. These people hail from large banks, venture capital companies, investment houses and leasing companies.

Testimony From Accountants

The Justice Department will complete the presentation of its case-in-chief with testimony from two accountants, who are also special agents with the Federal Bureau of Investigation, and nine of the people on the economic staff advising its attorneys in this litigation.

Calling IBM's claims of the need for such a list "without merit," lead government attorney Raymond M. Carlson stated IBM has known the order of the Justice Department case since publication of its pre-trial brief back in 1974.

In its papers, IBM counsel stated there has been a need for a new list for some time, but particularly since Carlson's statement in mid-July that the government is "seven-tenths" finished with its direct case [CW, July 26].

'Idea' Software Designed for DG Minis

(Continued from Page 1)

Idea software runs on the C/300 and costs $3,000 for the initial purchase with support services and $2,000 for additional installations without support, DG said.

The C/330 incorporates a 64K-byte NMOS memory on a single board with a 500 nsec cycle time and error correction.

The mini also features an enhanced memory allocation and protection (MAP) unit that provides hardware protection for programs and data in multiuser systems and allows memory on the system to be expanded to 512K bytes, twice the memory previously available on the Eclipse system, a spokesman noted.

Four data channel maps, as opposed to one on other Eclipse models, allow a total of 128 registers to be available for peripheral addressing, increasing the number of peripherals that can operate concurrently on the data channel, the spokesman said.

A "look ahead" algorithm with an 80% hit rate is said to decrease system mapping overhead by about 5%.

Module Doubles Density

A 32K-byte core memory module doubles the density of DG's previously available 16K core modules and features an 800 nsec memory time, according to the spokesman. Core and semiconductor memory can be mixed in one system and modules can be interleaved up to eight ways, DG said.

Idea software consists of a screen format generator for free-form format design, a compiler for specifying field processing and an on-line multiterminal monitor. A user-transparent interface provides access to the Infos data management system, the firm noted.

The screen generator allows users to design and store multiple formats interactively from the system console. The compiler lets the user specify how data fields, defined with the generator, are to be processed, using more than 40 "English-like" processing instructions.

Emulating both IBM 2780 and 3780 RJE terminals, the software supports line speeds up to 9600 bit/sec or up to 56 kbit/sec with the firm's DCU/50 communications processor.

The 600 line/min printer, also introduced last week, is designed for use in applications requiring high-volume output, DG said. It is available with a 64 Ascii character set or a 96 character set.

A four-terminal Eclipse C/330 with 192K bytes of core, 10M bytes of disk, 9-track magnetic tape, 300 line/min printer communication chassis with multiplexers, Dasher terminal printer, CRT console and four CRTs with Rdos, Infos, Idea, Cobol, RPG-II, RJE80 and utility software costs $120,500.

A full 16-terminal system with 384K bytes of core, two 92M-byte disks, tape subsystem, 600 line/min printer, communications gear, Dasher terminal, CRT console and the software costs $230,000.

The C/330 CPU alone costs $58,000 with 256K bytes of core memory and $88,500 with 512K bytes of MOS memory.

The 600 line/min printer and controller costs $18,000. All products are available in 90 days from the company in Southboro, Mass. 01722.

Burroughs Cuts Memory Prices

(Continued from Page 1)

100K byte modules, from 200K- to 1M bytes.

For the B2830, module price reductions for memory increments from 150K- to 350K bytes are 18.8% for purchased memory, 9.8% for leased. The reductions for 400K bytes are 24.3% for purchased, 15.9% for leased; and for 500K bytes, reductions are 27.1% for purchased, 19% for leased.

A 750K byte increment would cost $166,680 or lease for $4,630/mo while 1M byte of memory would cost $226,080 or lease for $6,280/mo.

For the 3830, increments to 350K bytes have been reduced 28.3% for purchase, 8% for lease.

In addition, 400K bytes of memory has been reduced 34% for purchase, 15.3% for lease while 500K bytes is down 36.9% for purchase, 19% for lease.

A 750K byte increment for the B3830 can be purchased for $179,640 or leased for $4,990/mo while a 1M byte increment costs $242,640 or leases for $6,740/mo, the spokesman said.

Reductions on B4840 memory are 31.3% across the board for purchased memory, 20.6% for leased modules.

Honeywell Increases Maintenance Prices

(Continued from Page 1)

60, 6000, 200 and 2000 products; series 700 and 1640 equipment; Multics systems; data entry and selected communications equipment and nonstandard products.

Maintenance charges on Series 60 Level 61 processors, however, will be raised 7% and Level 6 minicomputer equipment and high-speed page printing systems will not be affected, she said.

HIS maintenance prices will be increased 7% for G200 central systems; 15% for series 100 and 800 equipment; and 10% for most series 400, 600 and 50 computers as well as for Model 8200 processors.

There will also be selected maintenance price increases of 7% to 9% on certain communications products and 7% to 15% on some peripherals and features, the spokeswoman said.

The 9% increase will affect series 300 and 2300 VIP systems as well as Datanet 30, 305 and 355 front ends.

U.S. Postal Route Plan Halted As Standard Delivery Resumes

(Continued from Page 1)

rier routes. But the USPS conducted studies with predetermined standards that did not comply with either Nalc's labor contract with it or with the individual differences of each carrier, Rademacher stressed.

At Rose City Station

As a result, all letter carriers resumed the routes they had before the Kokomo Plan went into effect at the South Station in Kokomo, Ind. in Nov. 1974 and at the Rose City Station in Portland, Ore. in February 1975.

At Rose City Station, where mail volume increased shortly after the test plan went into effect, four carrier routes were restored. The Portland carriers no longer work overtime and the mail is being delivered on time, he added.

USPS initially utilized what is known as methods time measurement (MTM) studies to provide a test basis for computerizing letter carrier routes because "it was very expensive to do a time and motion study" following each carrier with a stopwatch, a USPS spokesman explained.

The MTM studies, however, are an old system of work measurement primarily applied to a machine shop environment, the spokesman admitted, adding an "outside engineering organization" was called in to tailor MTM to letter carrier routes.

Data on mail volume, route distances, quantity of mailboxes and other standard factors were used by the USPS computer system to plan routes.

Garrett's ruling is a setback to the USPS which experienced a $1.4 billion deficit during fiscal 1976.

The Kokomo Plan method of redesigning carrier routes into a standard applied on a national level was expected to eliminate 15,000 to 25,000 jobs through the process of attrition over a period of three years, the spokesman said.

'Arm-Wrestling Match'

"We are dealing with a classic arm-wrestling match between union and management" over the computerized route evaluation system, he explained.

USPS will continue to find ways to utilize computers for some kind of carrier route standardization in the future.

The spokesman added there is nothing wrong with using computer systems; "they are a means of holding data that would be too cumbersome to maintain any other way in a national system."

Standards Key to Effective Technology Transfer

By John P. Hebert
Of the CW Staff

ATLANTA – Information and technology can only be transferred effectively after the development of standards for computerized urban information systems, according to a speaker at the Urban and Regional Information Systems Association (Urisa '76) conference here last week.

This transfer is crucial, James Bohnsack, operations manager of the software systems division of Public Technology, Inc., said at a session on "Information Systems Standards."

He noted there are presently over 32,000 cities in the U.S. which use computers and information processing systems – without using any common standards.

"People in this industry are aware of the need to develop standards," Bohnsack said, "but they keep standards in isolated systems so, as an industry, we have no common standards. This puts us in a bad position in terms of new information systems."

These systems are in cities with populations of 10,000 or more, but "I expect the rate to increase exponentially in about five years," he said illustrating the problem.

"Big cities initially had the computer and information systems and then smaller cities got them when the cost came down." People in the smaller cities often don't know what they have them for or how to use them, he said.

Standards Needed

"Information processors in the smaller cities won't know how to effectively direct their creative energies until there are standards developed to do the more-routine work," he implied.

"There are so many people [in government] with a knowledge of computers and no knowledge of local government. It was fun for them, but how many innovative ways can there be to develop systems for utility billing?" he asked the small assemblage.

"We are producing redundant systems that add no knowledge to the field, use energy to rebuild the same systems and use creative talent for a reinvention of innovation," he said.

And even though there are many who agree standards should be developed, "we seem to have a hesitancy to do that.

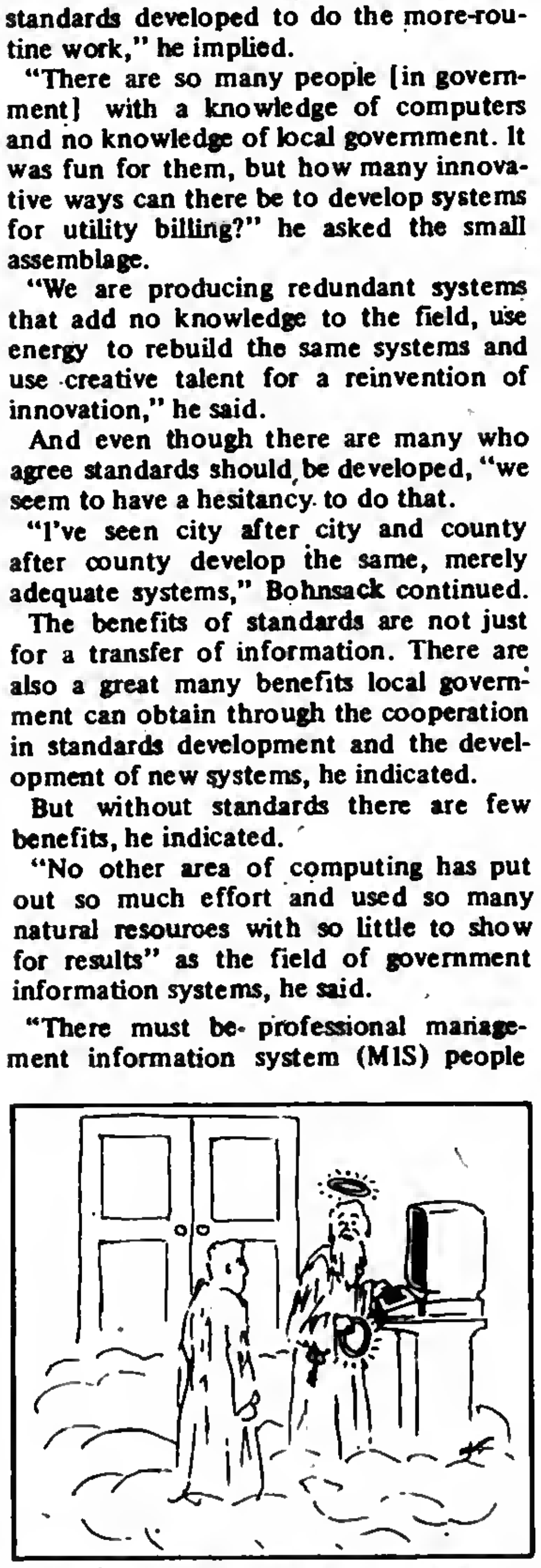
"I've seen city after city and county after county develop the same, merely adequate systems," Bohnsack continued.

The benefits of standards are not just for a transfer of information. There are also a great many benefits local government can obtain through the cooperation in standards development and the development of new systems, he indicated.

But without standards there are few benefits, he indicated.

"No other area of computing has put out so much effort and used so many natural resources with so little to show for results" as the field of government information systems, he said.

"There must be professional management information system (MIS) people rather than professional systems people" in on the development of any urban information system, Bohnsack said.



Let Me Check Your Record With the Master's File."

Bringing this concept of standards down to the application area, Robert Malvestuto of Miami, centered on ways to bring it about.

Malvestuto helped to develop in information system for Miami which "was an independent agency of the city, so it cut across department lines," he said.

It is important to keep everybody who will be using the system in synchronization – something which was totally out of control in Miami, Malvestuto said.

Describing the techniques of systems development, he noted the designers asked users of the system to state their requirements the best way they could.

Each user had to sign off each document run for them, he said, explaining the necessity of user involvement. To sign the document off, users had to pay attention to the system and show an interest in the system.

The task force assigned to develop system standards, including one MIS person and his staff, had received some resistance from the administration staff, Malvestuto noted.

CW at
Urisa '76

The administration staff, he said, was afraid their creativity would be stifled by a system with built-in standards.

"But there was no real restraint on their creativity," he added.

The user-oriented method to gather information, so as to develop standards, was used on two different projects successfully, he said.

Andrew Atkinson of Cincinnati's regional computer center, noted the importance of user participation as being a necessity in developing an MIS.

"Before you do anything in information systems, get together with users to design and implement an application that can be used," he said.

"Identify a methodology to define user standards and build a user file by taking the role of a user group," Atkinson suggested.

In designing a data base in this manner, he said, a common data base can be developed which cuts across and serves multiple agencies.

Besides having a system that works, there are the additional benefits of efficiency and reduced spending by many agencies sharing operating costs, he said.

"Standards are necessary in the evolution of our industry," Atkinson concluded.

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CW at Urisa '76

Less Complicated Systems Promote Human Liberation

By John P. Hebert
Of the CW Staff

ATLANTA – "Computer liberation really means human liberation. I want the computer to be a simple tool for every human being. It is a great delusion that the computer is only a scientific and emotionless entity."

These were some of the remarks made here last week by Ted Nelson, an author, researcher, consultant and self-proclaimed "liaison between the counter-culture computer field" and the "straight" computer world.

Speaking at an early morning session of the Urban and Regional Information Association (Urisa '76) conference entitled "Computer Liberation and the Future of Cities," Nelson concentrated almost exclusively on the liberation of computers and consequently humans.

"It is only a frame of thought that tells us we have to go on using large computers. Computers are now being sold with a lot of unnecessary cabinet space and you can only use that space as a place to hang your coat."

"The big computer companies don't want people to know about the great revolution" of liberation that is taking place in the field of computing, Nelson told the audience of city planners and urban information specialists.

Handing out one of many hard knocks to IBM, he said, "there are reputed to be various firms which have gone a long way to make computer use difficult.

"We now have strange systems with complicated structures. I don't hate IBM, but their concept of the computing frontier has nothing to do with technology, nothing at all," he said.

Some systems can be designed to be learned in 10 minutes, he continued.

"There are a dozen companies putting together kits without core memory for $500 to $600," he said, arguing the computer-on-a-chip technology has not yet hit the "straight" world of business applications.

Nelson completed the thought when he told attendees they were at the point to "do your own thing on your own computer in your own way."

"Things are happening so fast in the 'dinky' computer world that the history will soon have to be written by the hour," he said.

Turning his attention to the complexity of languages in common use today vs. the goal of systems which are easy to use, Nelson said such languages "have kept us mired in excessive heavyweight equipment."

And to illustrate his loathing of complex restrictive languages, he told the assembly the University of Illinois gave him a "subtle hint they wanted me to leave by having me teach Fortran." He noted he soon left the school.

Structured programming, an idea conceived by Edward Dykstra in The Netherlands, is part of the wave of the future because of its lack of GOTO statements, he said.

"Languages which use the GOTO statement are hard to debug, hard to change" and, as the volume of the program increases, the complexity increases geometrically.

Structured, easily used languages are moving ahead rapidly and are a great part of this computer revolution, Nelson said.

"We don't want oppressive limitations by the people who design software," he noted.

Future Prediction

Turning his attention to the future, he predicted by 1980 there would be "five computers in each home and two fully-programmable processors on your person.

"We need ways of combining data bases to overlay information from different areas. We need relationships with the data base as a whole," he said.

"There is no use (even now) for big computers except for big number crunching," Nelson said.

Attempting to bring Nelson's discussion back to its relation to the future of cities, Edward Hearle, a past Urisa president and president of the government services division of Booz Allen Public Services, asked him if there was any way to get these systems implemented.

"If such systems are developed and can be used, then we'll find the ways to implement them," Nelson replied.

Wilbur Steger, another past Urisa president and now president of Consad Research Corp., reminded attendees that the urban and regional information system problem is a data base problem and, should the small computer replace the large, how would the small ones cope with such a problem?

Nelson replied, somewhat obliquely, it is already economically feasible to replace an expensive typewriter with a computer terminal.

"I would like to be able to directly type in my federal tax return to the [Internal Revenue Service] and deliver it straight to the data bank, but I am not able to do this," he said, giving an example of dealing with the data base problem apparently by circumventing it.

The way of solving the problem, Nelson implied, is to approach it from a completely different angle.

"The real problem is how to look at all of this mentalware, this thinkware, mental electronics. Finding ways of windowing the data and looking back from there is how you have to think," he concluded.

Land Use System Paves Way for Growth

By John P. Hebert
Of the CW Staff

ATLANTA – The medium-sized city can pave the way to improved management growth by developing a standardized, computer-based land-use evaluation system, according to a senior planner for a city where such a system is a reality.

The reality of the Computerized Land Use Evaluation System (Lues) came about after five years of system study by the city's planning division because of the desire to develop an organized system approach, William Diuguid, senior planner for the city of Durham, N.C., told attendees here at the Urban and Regional Information Systems Association (Urisa '76) conference last week.

The system was intended to provide more data and time to analyze a proposed site plan for development, subdivision or rezoning requests for medium-sized cities, Diuguid said.

The program was initially intended to be a manual system, he said, but after the comprehensive approach was agreed upon, the planning division realized the great amount of data needed and began the task of determining what types of computer hardware and software the program development would utilize.

After experimenting with the city's Burroughs Corp. B3506 and IBM 1130 systems without a full-time planning division programmer, it was decided that it would be more economical to buy a minicomputer dedicated to the Lues tasks, Diuguid said.

The planners for the city of 105,000 people bought a Digital Equipment Corp. PDP-11/10 system with 16K words of storage, expandable to 28K, he said.

Getting the system wasn't difficult, Diuguid told attendees, because the division told the city council it was buying a "digitizer and the equipment to support it."

The equipment, including a Decscope CRT terminal, a Decwriter II console for paper output, two DEC RK05 disk drives with 2M bytes of storage, a magnetic tape unit and a Science Accessories Corp. Graf Pen, represented a $38,000 investment, excluding maintenance.

Since the investment is over a five-year period, the impact on the division's $270,000/year budget is not too substantial, he added.

Lues supports four basic areas or modules: a growth policy module, an infrastructure module, municipal and financial analyses module, and an environmental module, he noted.

These modules are used, he explained, to look at alternative growth policies available to the city relative to a proposed development and the surrounding area, to determine the availability of city facilities and finances and to gauge the impact of land use change on the environment.

These modules, based on nine Lues data files, allow the use of the computer to identify property resources or natural resources, Diuguid said.

An example of the benefit of this type of information clearinghouse is the identification and preservation of historic structures, he said.

A register of historic places, he continued, helps in ways other than deciding how to build around them. It also helps, for example, to keep the properties in good condition because it helps to inform the owner of a 50% reduction in property taxes if the building conforms to national standards, he explained.

The important points to remember when developing a computerized land-use system include asking questions about how much software development is involved, because "people in government don't tell you this," and getting as much information as possible so the city planners will know what alternatives they have, Diuguid said.

In addition, sine Durham had no city-wide standards, the planning division had to develop its own standards to provide a conceptual foundation for Lues.

Moreover, because the planning division had no graphics CRT terminal, it had to run a tape of geocoded plotting information on the city's computer system.

Urisa Attendees Told

Define Minis by Application, Not Machine Size

ATLANTA – How do you define a minicomputer?

"Forget attempting to answer that question in the traditional sense" was the advice given by Ted Britton, distributed processing manager for Georgia.

Define a minicomputer by application, Britton told attendees of an Urban and Regional Information Systems Association (Urisa '76) conference session on "Minicomputer Applications in State Government" here recently.

"Minis support the same equipment as the larger machines do. The important thing to do is determine where they can be used in federal, state and local governments," he said.

"The key is to not tailor the hardware to fit the application." Define the application and find the hardware to fit, "not the other way around," he said, describing what he called one of Britton's commandments.

Get Proper Support

When looking for a system, get proper vendor operating system support, get the software available to support your application and also push for training and system maintenance from the vendor, he advised.

"Don't try to build an empire with small processors without organization," Britton added.

Britton noted Georgia has between 250 and 350 intelligent terminals active statewide which are part of a distributed processing system. There are now 400 small processors doing the work at regional levels to support the larger mainframes.

Some of these are stand-alone processors, he said. For example, there is a minicomputer in the state's crime lab because of the need for information security and to satisfy state laws governing that information.

Britton saw one application – distributed processing – as the method of information handling for the future. "It allows minis to do the thumbtack hitting and allows the big machines to do the 16-penny nail hammering," he said.

DP Autonomy

By putting processing closer to the source of information, there will be "true distributed networks where each node has its own autonomy for DP where and when it is needed," Britton added.

Another field where minis will find a place is in data communications. "Data communications will be the biggest field of small processor use in the near future because of the need for machine intelligence.

"It has been limited to very large companies with a high degree of skill, but little companies can now support telecommunications. The small processor makes it possible to get to the information where it exists in a timely manner," Britton said.

Aid Decision Making

The processors help make decisions in government, he said, adding that Georgia has 1,100 communications terminals across the state, of which 60% are intelligent processors.

The state has added 600 of those devices in the last few years, he noted.

Intelligent communications processors can be used for message routing, can store messages on disk and forward the information even if the mainframe is down and can change protocols to communicate with different processors using different communications languages, Britton said.

It is also cheaper, dollar for dollar, to accomplish data communications in this manner, he said.

Served as Consultant

Peace Corps Aide Notes Colombian DP Experience

By Ann Dooley
Of the CW Staff

BOGOTA, Colombia – After spending two years on a computer program that monitors grants to small businesses in Colombia, Stuart Abramson, a Peace Corps volunteer, feels like he has returned to the mainstream of computer technology again.

During his two years in the Peace Corps, Abramson worked as a consultant to Colombia's national vocational training service (Sena), which is a governmental agency that provides assistance to certain small companies who in turn pay approximately 2.5% of their monthly payrolls to Sena.

"[Sena doesn't] develop any basic research there, themselves. Their equipment is just as modern but they are two to three years behind in technique," he said.

For example, they are just introducing IBM's IMS data base management system into Colombia while it has been in the United States since 1969. Also, they are not on-line to interactive terminals to our extent, Abramson said.

Sena does not have its own computer but is connected by terminal to an IBM 370/145 at Colombia's national statistics agency, Abramson said. The equipment used is 95% IBM and the remainder is Burroughs or NCR equipment, he explained.

One reason they are not more advanced is because of the expense, he said. "A professional who has been in the field for three to five years in Colombia would be lucky to earn $500 a month and in the U.S. it could be three times that much," Abramson said.

'Slow and Cautious Decision'

The problem is caused, according to Abramson, because any computer package must be paid for in U.S. dollar equivalents. On a relative scale, one package might cost two or three times as much as it would for an American company, he said. "So the result is a very slow and cautious decision for any software or hardware purchase," he said.

"One of the worst difficulties is in maintenance problems," he said. "If there are not enough spare parts and the machine goes down, it might take two or three days to send out of the country for the part and that's an awful lot of down time."

Abramson's job was to write a system to monitor the progress of the agency's technical assistance program for small businesses and also to design an integrated data base management system to integrate its existing information systems.

"Sena asked the Peace Corps for someone to help build the data base, install it and evaluate its functioning," he said.

Abramson, who had no previous experience with an integrated data base, sent for books from the U.S. and spent the first six months on the job reading. Gradually he started programming.

Part of his time was also spent working on a program to track what kinds of services Sena is delivering, how many and what kinds of companies are receiving technical assistance, who the advisors are and which advisors are advising which companies.

"This will allow for administrative controls and permit planning for the future," Abramson said.

Abramson considers the experience worthwhile from both a personal as well as technical viewpoint and will return to his job with Control Data Corp. in Washington, D.C.

Electronic System Controls Cows' Diet

LELYSTAD, The Netherlands – "Bossy" has moved out of the pasture and into a computer-controlled environment for food intake planning.

A computer system, designed by D.A.C.A. Electronic Engineering & Contracting Co. here in cooperation with the Dutch Institute for Agriculture Mechanization, supervises the amount of food given to each specific cow according to its needs.

After a successful year's trial on a Dutch model farm, the system proved to increase milk yields, avoid concentrate waste and save human labor.

The small transceiver worn by each cow is the key to the entire system.

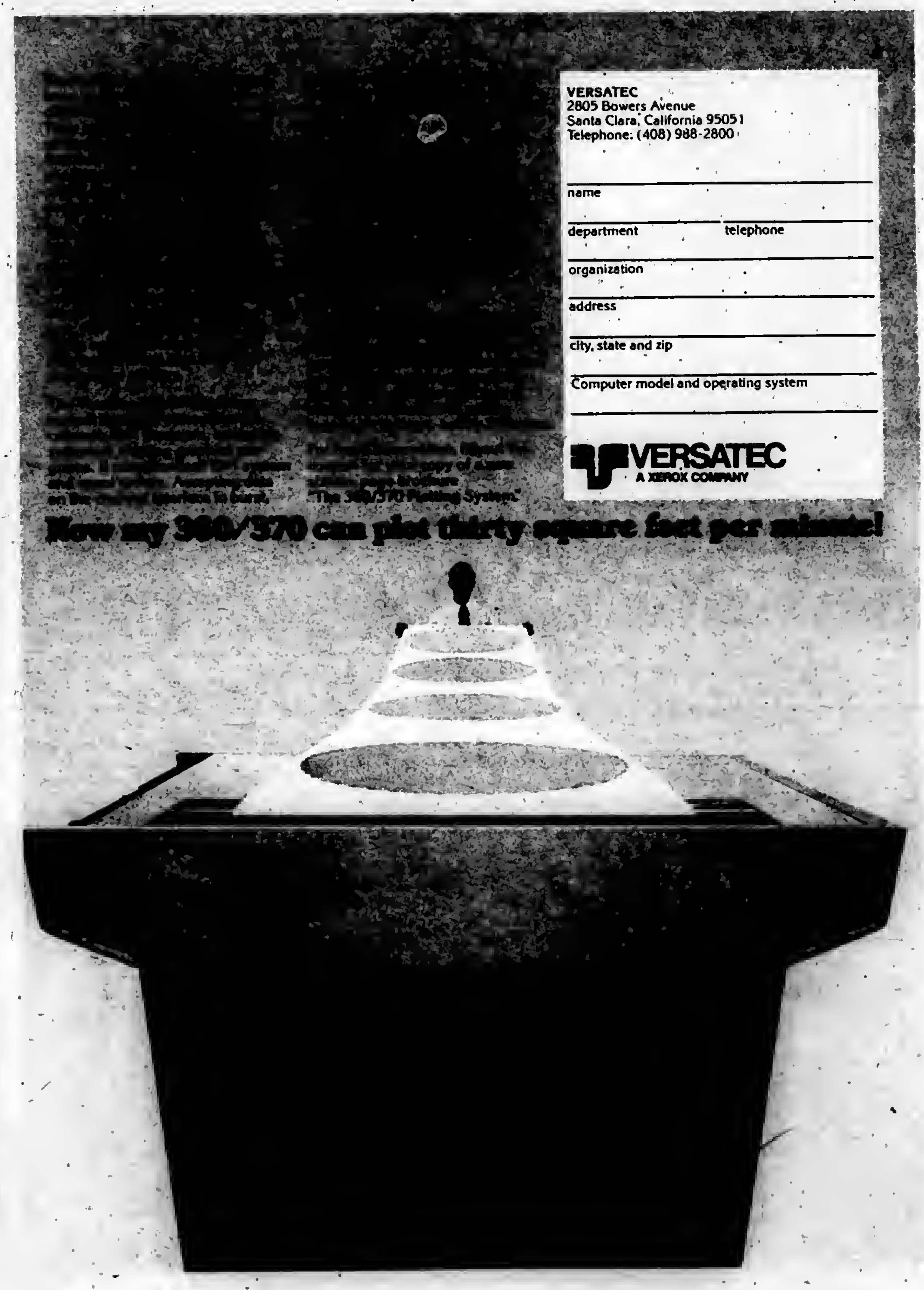
Designed for large dairy farms where it is difficult to identify individual cows, the system can record the feed given to a maximum of 254 cows.

Bovine Identification

A small transceiver worn by each animal on its collar, keys its number into the manger electronics unit as the cow approaches the manger. The number is relayed to the CPU where specific data relating to that cow is stored.

From this data, the central control panel determines whether the animal should receive concentrate at that time. If so, a vibrating pipe above the specific manger is opened automatically and a predetermined quantity of concentrate is given to the cow.

The information is stored in an effort to maintain constant supervision of each cow's daily regimen.



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Editorial

Death of Datran

The demise of the Data Transmission Co. (Datran) [CW, Aug. 30] raises some fundamental issues about the future of computer communications.

From its inception, Datran had tailored services primarily aimed at the data user. And after initially offering digital private lines, Datran inaugurated the first switched digital data service (DDS).

There is no doubt that AT&T Dataphone Digital Service (DDS) and its now pending Dataphone Switched Digital Service (DSDS) were a reaction to Datran's pioneering efforts. Those who argue that AT&T would have introduced digital service anyway are clouding the impact of Datran on the emerging data communications scene.

Users who took a chance with this carrier were sold down the river with virtually no notice that service would be terminated. And the Federal Communications Commission's two-week extension has done little to help. Beyond the shabby treatment given to users. lies the tarnished image of the innovator. It will be harder now for other competing carriers to convince users that there is an alternative to Bell.

AT&T and the other existing carriers will say that the death of Datran illustrates the risks of innovating with a corporate communications capability. But does a common carrier have any greater obligation to its customers than any other service in business to make a profit? Maybe not, but somehow the FCC and the purpose of regulation have to provide some measure of protrection to the user. And in these cases it is always the user that gets caught.

The death of Datran also makes a mockery of the foundation on which rests the proposed Consumer Communications Reform Act. Obviously Datran would not have slipped beneath the microwaves if Bell's dire warnings about specialized carrier cream skimming had been accurate. Needless to say, Datran would have been satisfied with only a small portion of the lucrative income that Bell predicted.

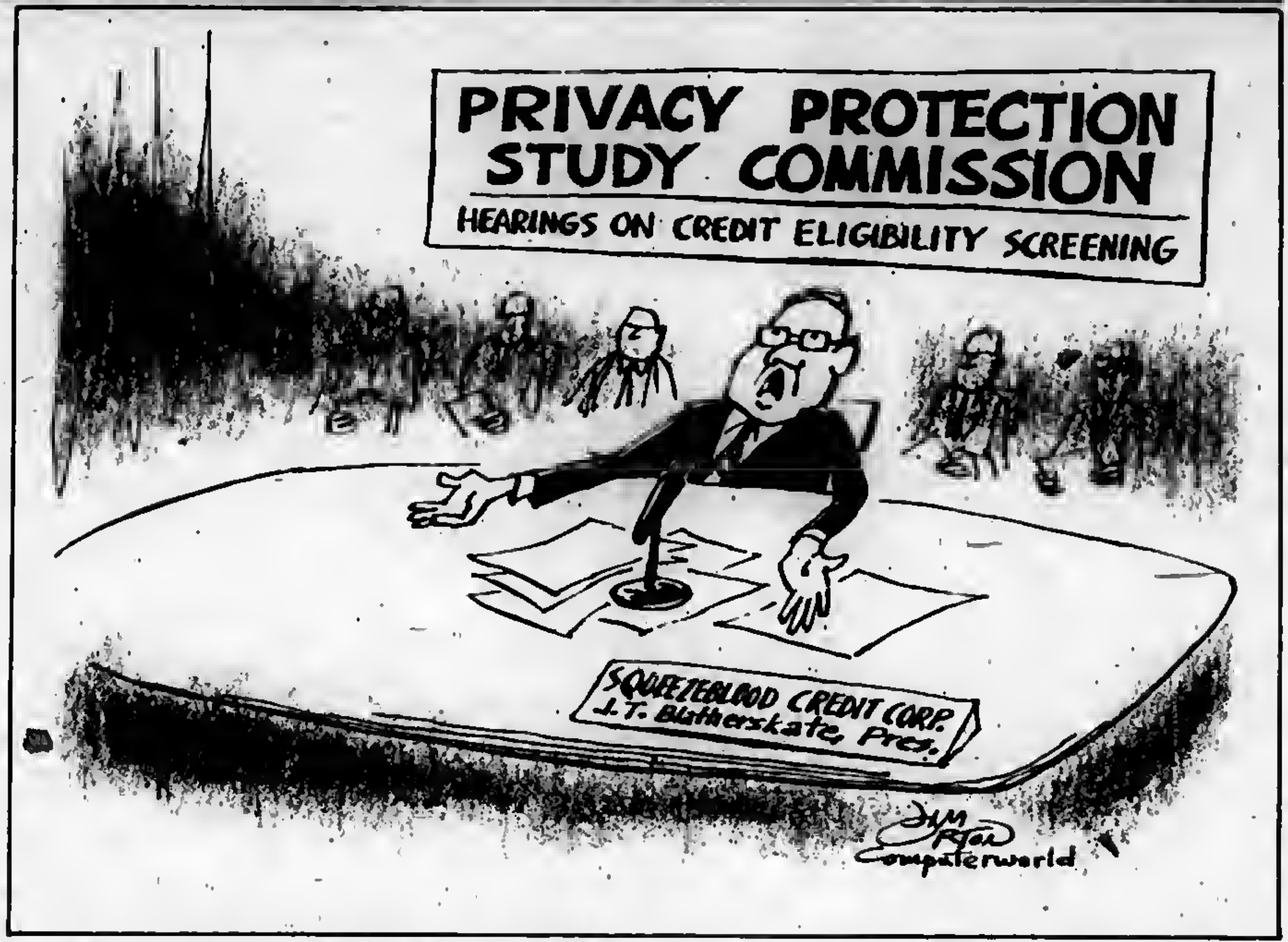
Ironically Datran was probably one of the few original specialized carriers that could have been legally sanctioned if the reform act were passed. The carrier offered a unique service not duplicated at the time by the existing carriers and thus would have been allowed to compete under the conditions of the reform act.

The larger issue is one of questionable survival for a carrier that elects to compete with the all-powerful Bell System. In authorizing the creation of the specialized carriers, the FCC said it would not shelter the new competitors.

If the FCC policy of full and fair competition is to prevail, ways must be found to limit the power of the Bell System in an orderly and beneficial manner.

Like the song says, the specialized carriers are dwindling down to a precious few. It is a long, long regulatory time from May to December. And the days grow short when you reach September.

The days are growing short for the specialized carriers and an industry may be slowly dying. Unless something is done, users will no longer have a choice.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'. . . But I Ask You, Mr. Chairman, Would You Lend Your Own Funds to Someone Who Plays Without a Golf Cart, Wears an Onyx Tie Bar With Cufflinks to Match, Belongs to the Society to Revive the Bull Moose Party, Drinks Canadian-and-Diet Cola Straight up, Reads Playboy *for the Political Articles and Who Watched All of the Democratic Convention on TV?'*

Letters to the Editor

Benson's Opinion of Snobol 68 Too Simplistic to Be of Value

I think Miles Benson's article, "Snobol 68: A Thing of Beauty, But No Help to Programmers" [CW, Aug. 23] is rather fatuous. Mr. Benson suggests that a programming language is a failure if, due to excessive sophistication, it "is never used for the purpose it was designed for, to solve problems." That view is too simplistic to have any value.

Some "sophisticated" languages look great on paper but are too complex or rigid to be useful in practice. Such a language deserves to be called a failure; but a language can become known as "too sophisticated" for many reasons.

Let's face it: the big reason why Snobol 68 "failed" is that someone with a vested interest smothered it under a dollar-scented blanket.

If a language fails to gain acceptance for reasons like these, it is not a "failure." We, its intended users, are the failures.

Jonathan Sachs
Chicago, Ill.

Creativity Doesn't Equal Chaos

In her letter [CW, Aug. 16] Anita Benson made an appropriate analog between programming and the arts. However, she made the same mistake made by many neophyte artists (and progressive educators) – she equated creativity with chaos.

Creativity is not undisciplined. To the contrary, most of the world's greatest artists, writers and musicians achieved their greatness and displayed their creativity only by the most disciplined application of their talents.

So it is with programming. The creative aspect of programming is far from dead.

Yes, Benson, I would prefer "a hand-crafted piece, made with pride, that will last a lifetime and be a joy to use.".

But would you hire a carpenter to build that piece if his only tool was a sledgehammer? Let it be the same with computer systems.

R. Daniel Bergeron
Associate Professor of Computer Science
University of New Hampshire
Durham, N.H.

Let's Get on With It

Two letters headlined "Not Worth the Fuss" and "On Discrimination" [CW, July 26] both appear to have been written by women. One signed her name Jean Sisson; the other, as though reluctant to sign a given name, signed merely K. Spiegelberg. Sexless, to be sure. No one can tell whether male or female. What a pity!

I agree with Spiegelberg's remarks to a degree and with Sisson's without degree.

I am a DP manager for a county highway department. I do not have biceps, bulging or otherwise, and am not a Women's Libber except in agreeing that equal pay for equal responsibility should be mandatory.

I have been in DP for over 10 years and I do not feel I have been discriminated against in the profession.

So, indeed Jean, let's get on with it. We all have too much to do to engage in this matter any further.

Roberta Blanchette
Phoenix, Ariz.

Data Past

Five Years Ago
Sept. 8, 1971

WASHINGTON, D.C. – A study made by Compata, Inc. for the Computer Lessors Association (CLA) concluded that users can improve the performance of IBM 360 systems by between 85% and 185% through hardware and software changes.

– – –

WASHINGTON, D.C. – The Federal Bureau of Investigation decided to attach the computerized National Criminal History System to its smaller – and significantly different, but already operating, National Crime Information Center.

Eight Years Ago
Sept. 4, 1968

WHITE PLAINS, N.Y. – IBM made obsolete the PL/I Language Specifications Manual – the nearest thing to a standard – causing users to fear proliferation of dialects within the language.

– – –

LOS ANGELES – Sim One, a computer controlled medical machine capable of many of the reactions of a human patient, was announced to speed the training of anesthesiologists.

A Rose by Any Other Name...

. . . would almost certainly smell differently, according to today's media philosophers and advertising proponents. I agree in one particular case at least, the probable re-naming of the Association for Computing Machinery, which will smell much sweeter to members and outsiders alike when the generations-old label is curtailed. But there is a name problem of very much greater interest to CW readers: a problem at least as hard to resolve as the ACM one, and for which no really clever solution has yet been proposed.

What, in Babbage's name, shall we call an expert computer user?

I'm not worried about insider names and classifications. Sure, we wrangle at length about "coder", "programmer", "analyst"; about "computing", "data processing", "information handling"; about the meaning of "systems software", and a hundred other important words and phrases. But that's among ourselves; we know which words are clear and stable (at least this year!) – "chip", "COBOL", "CDP" – and which are muzzy – "firmware", "systems engineer". What I'm talking about is the title and classification mess as it affects personnel people, major employers, and above all the local, state and federal agencies.

Not just Civil Service, either; we have all sorts of job-related agencies and departments and commissions. If you get laid off, there are different forms and different queues and in some cases different benefits for professionals versus blue collars. If you need to work odd hours, there is the question of shift differentials; for women, there is less specialized treatment – good, bad and outmoded – for management and technical personnel than for key punchers; once upon an ugly time, there was a thing called The Draft.

And the key is nomenclature. Call a guy a computer scientist and he's *ipso facto* fancy (and expensive). Call him a software engineer and he will be less so, but much more in demand. Call him a technician, and it's the timeclock forever. Trickier still for women, of course: "scientist" is pretty unisex, but not "engineer", so the fact that from punched card times most customer support reps – now called SEs, systems engineers, in many companies – were gals [irate feminists please note the use of "guy" earlier in this same paragraph], does not prevent bureaucrats from regarding the *label* as masculine.

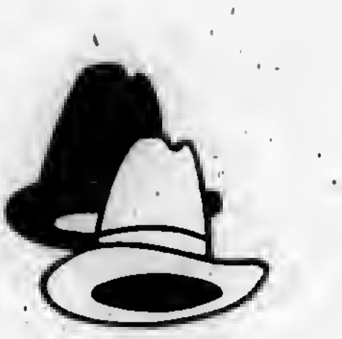
I realize the depth of the problem. We have curriculum and course labels in schools, colleges, universities. We have historical problems: DPMA was once the National Machine Accountants Association. We have misnomers and deceptions, and a steady inflation of both names and definitions: supervisors become managers, managers become directors, directors become vice presidents in-charge-of. I heard several years ago, before the aerospace boom collapsed, of an "installation maintenance specialist", who kept the floor dustfree in a big 360 shop! And we have archaic laws, as poorly adapted to computer realities in the field of nomenclature and job classification as in, say, copyright. It is not easy to improve things.

The task would be much simpler if we had gone along with the word-coiners in the Forties and early Fifties, and adopted "Informatics", or some such. I was opposed to it at the time, but have come to regret the decision. In France, where "ordinateur" did not grip as hard as "computer" has here, most of us would be *informaticiens* (I have not myself seen *informaticienne* used!). Is it too late here? I'm afraid so.

The preferred university term is "computer scientist", but I'm deeply opposed to the *wide* use of that label. For those who teach and do research in computer science, which is a small and highly esoteric field indeed, fine; there are such people in industry and government, and not just Minsky and his minions. But to call people who do systems analysis and applications programming and software maintenance "scientists" is self-defeating; the bureaucrats won't buy it, and will then be impossibly suspicious of the people who really are! Moreover, if the analogy with physical and biological science holds true, about the only entry to the computer scientist title will be via a Ph.D. program so labeled. That will bar most of the youngsters, or cheapen the doctorate, or both. No soap!

"Technician" is out; that means a subprofessional everywhere: the bench worker who wires up the experimental module, the tape librarian. "Computer technologist" might be possible; on balance, I prefer it to everything I've heard so far except informatician, and it's not weird like the latter.

What is probably needed is a serious commission under joint Federal/AFIPS sponsorship, but including people from non-AFIPS groups like ASM and GUIDE, to construct a short list of approved labels: "computer scientist", "software engineer", "systems analyst" and so on, with clear recommendations of professional status, curriculum references, and experience descriptions. Then, next stop Civil Service. And hurry!



Herb Grosch

Don't Be Lax

DPers' Evasions Aid Computer Crime Performances

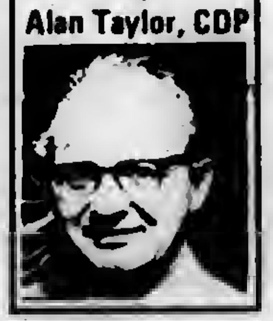
Charles Gottlieb and Ross Jerome are free-lance journalists who jointly wrote a long article on computer crime, published in the Aug. 22 issue of *The Boston Globe*.

The article was fairly good, although a bit off base in stating when the first computer crime took place. (They place it in 1966.) They researched with local corporations such as The Gillette Co., John Hancock Mutual Life Insurance Co., the Computer Security Institute and with the Commonwealth of Massachusetts director of DP.

The Taylor Report

By

Alan Taylor, CDP



Still, the main play was not so much the local scene, but the national one. Gottlieb and Jerome led off with the tale of a journalist who went through Pacific Telephone and Telegraph Co.'s DP operations in Los Angeles and gleaned enough information to permit him to grab about a million dollars worth of equipment.

From here they went through the normal list including such items as:

- Switching bank deposit slips ($250,000)
- Los Angeles City cheques ($2 million)
- Equity funding ($2 billion)
- Government cases ($2 million)

This was done mainly to sensitize the reader. More technical points followed – at least in summary. They mentioned the problems that exist: The fact that computer programs can be copied – leaving the owner-in-possession apparently undisturbed; the result of using automated decision making regarding levels of 'uncollectibility' purging records from a file or adding phony asset records. Naturally this is brief, but it is there for the reader to consider.

Programs as Hostages

One point, which I have not seen elsewhere, regarded the use of computer programs as hostages to be ransomed. This would be a perfectly workable system if programs were sabotaged and the only good copies, that could be trusted not to foul up the files, were in the programnapper's hands. A nice touch brought out just before they came to their final and poetically neat conclusion, which is what most interested me.

Apparently, the people they interviewed did not check with the *Globe* to verify if Gottlieb and Jerome were actually journalists.

The question is: Why don't DPers suspect and check up on these things? I don't know, but I have a suspicion that the answer to this question has to do with the environment we live in.

Another journalist, Phyllis Cobbs, in a story titled "The Computer Calls the Tune," talked about computers' inability to digest simple numbers. She listed the 26 digits of American Express, the 14 digits of BankAmericard, 15 of Con Edison, etc. However, her main attack seemed to be on the problem of trying to understand and respond to the various, sometimes unintelligible, "explanations."

And she had a real gem, which she quoted from the Manufacturers Hanover Trust Master Card area. This occurred in the midst of explaining new billing procedures. The paragraph in particular read:

" . . . under certain conditions, a finance charge may be imposed for purchases which have not yet appeared on your billing statement."

What this means is that Manufacturers, like many other DP areas, permits the computers to produce uncheckable statements and charges. This means the prime bulwark against computer crime is missing.

Anything that is known to be uncheckable will normally go unchecked and, if occasionally checked and then found to be incorrect, can far, far too easily be explained away as "a finance charge for something we haven't told you about" or "a computer mistake" or "something that we will investigate."

We have all seen these kind of evasions.

Ease of Computer Crime

In their investigation, Gottlieb and Ross omitted the ease of covering up computer crime with these excuses. Yet, it is this willingness to accept surface investigations, to approve uncheckable record systems, to generally – as Cobbs pointed out – let "the computer call the tune" and even to give pretentious cover-up stories that is providing the computer criminals with some of their best advantages.

Having the right to let our systems ignore the needs of checking documents or providing real explanations has for years made things easier for systems analysts, software designers and operational managers.

The costs of this DPer case are only now being counted. Hopefully we can soon start putting the lax standards of yesterday behind us and, at least, stop these simple loopholes.

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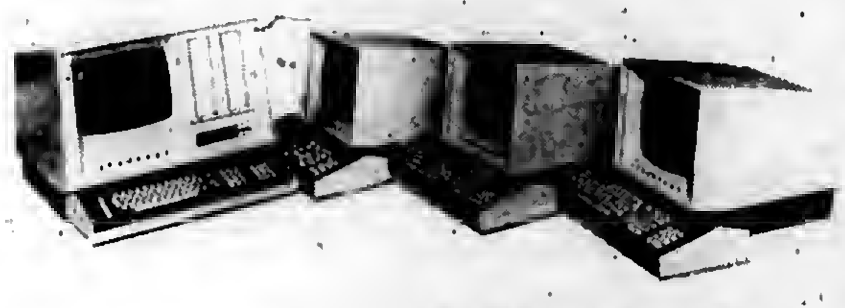

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Reader Commentary

Guidelines Offered for Selection And Use of Outside Consultants

By Philip C. Cross
Special to Computerworld

It is unfortunate that many companies will pay an outside "expert" for making recommendations that company employees have been making in vain.

And, it is even more unfortunate, perhaps even poetic justice, when the outside expert's recommendation is not as comprehensive, or realistic to achieve, as that of the employee.

But, as demoralizing as it might be to company employees in such circumstances, management may have no other choice but to contract an outside expert to provide a fresh and objective point of view.

This is particularly true when organization changes and responsibilities are in question and jurisdictional preferences cloud the business reasoning of the people involved. A prime example is the question of consolidating and centralizing computer operations and systems development in a corporation.

An outside expert may also be necessary to acquire experience not possessed by any employees.

A first venture into a new technology such as data transmission or data base management are examples where a company may not have in-house experts of its own and must, at least initially, go outside.

Outside experts are usually skilled analysts. They make it their business to know how to get to the root of a problem, recognize possible solutions and proscribe how the solutions can be achieved.

Full-Time Devotion

Another reason for contracting outside experts is that they can devote their full time to an assignment without the encumbrance of other responsibilities and carry it through to completion thoroughly and expeditiously, free from day-to-day distractions.

The availability of so-called outside experts is not a problem. They may be employed full-time by old, well established blue chip consulting firms or by small struggling partnerships. Or, they may be self-employed part-time moonlighters.

They may be contacted by placing advertisements, soliciting responses to requests for proposals, asking business associates or responding to their advertisements, fliers, telephone calls, or visits. There is no shortage of outside experts who are willing to be employed for a fee.

The multitude of outside experts ready and willing to be employed makes it a buyer's market. Under such circumstances, where the supply exceeds the demand, the buyer may become confused and not take advantage of the situation, but instead goes bargain hunting and it is too late when he finds that he has gotten only what he paid for — perhaps less.

It is not uncommon to encounter so-called experts whose motto is "Tell them what they want to hear."

An astute self-serving expert can quickly discern internal politics or ulterior motives within a company and sacrifice professional ethics to avoid a controversial recommendation in order to cement personal contacts for future business; or to expend a minimal amount of time and effort to collect his fee.

The method for selecting an outside expert is not complex. However, it could turn out to be a time-consuming task requiring experience and insight. For this reason, many companies hire an outside expert for the express purpose of selecting another outside expert.

Usually, in such a case, the outside expert who is employed to do the selection is with a company that specializes in that kind of service, or he is a one-man operation and does not have the staff or time to take on the larger consulting job himself.

Six Step Procedure

A simple six step procedure for zeroing in on the right outside expert is as follows:

First, prepare a specification that describes the environment, the problem or condition to be addressed and the result sought.

Second, consider only those outside experts having accomplishments and experience directly related to the specification.

Third, interview each outside expert to discuss the project and how they would handle it; and require that a written proposal be submitted to that effect.

Fourth, check the references of the actual individuals to be assigned.

Fifth, evaluate the written proposals and select the expert who appears to be best qualified.

Sixth, execute a contract that will clearly define the results to be achieved, the time schedule, costs and penalties for nonperformance.

The contract must provide the basis for effective control over the outside expert. Therefore, any desired controls, such as milestones, deadlines and status reporting, should be clearly defined in the contract.

Where possible, outside experts should be retained through fixed price/fixed result contracts — not time and materials. A fixed price/fixed result contract requires that the outside expert achieve a specific objective, at a specific quality level, by a specific time and at a specific price.

More Conventional Methods

Some of the more conventional methods for controlling outside (as well as inside) experts are:

- Use the phased approach to project management. This will cause the outside expert to conduct the project in phases so it is more easily understood. The usual phases in a project are feasibility study, analysis, design, development, implementation and surveillance. However, every project need not contain all of these phases.

  But, even if the project is one such phase of a larger project, it should still be broken down into discrete parts, with each part having a definite and agreed on result so that progress can be measured and go/no go decisions can be made.
- Require that any resulting documentation be prepared in the course of the project — not left to be done en masse at the end of the project.
- Use Gantt charts and Pert networks, if only to provide a graphic representation of the project and its progress.
- Execute and abide by a contract that includes penalties for not meeting objectives and milestones.
- Assign a competent employee as project manager, if only to oversee the outside expert and act as an internal coordinator.
- Periodically review status with responsible upper management — particularly when it has the authority and responsibility for actions pertinent to successful project execution.

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Requires Honeywell's Multics

'MDBM' Backs Network, Relational Data Approaches

By Don Leavitt
Of the CW Staff

PHOENIX – Users working with the Multics Data Base Manager (MDBM) just introduced by Honeywell Information Systems can have the best of two worlds, according to the vendor: they can utilize a network or hierarchical approach with some data bases; a relational approach with others.

Permitting the use of the two approaches applied individually to the user's data bases resolves the problem of having to decide between the approaches when a data base system is being chosen.

But the dual support has a demand of its own: it only operates on Honeywell's largest gear – the Series 60/Level 68 Multics system.

MDBM is said to consist of an integrated set of functions, callable from any of the major languages available in the Multics environment, including Cobol, Fortran and PL/I. These functions support the description and processing of data bases of varying sizes and organizations, Honeywell noted.

Full Range of Capabilities

Included in MDBM is a full range of data base retrieval and update capabilities with facilities to provide a "large degree" of data independence, a spokesman said. Data bases reside within the Multics storage system and are protected by all the security features inherent in the Multics virtual memory environment, he added.

The users' choice of approach to individual date bases is controlled by the Multics Integrated Data Store (MIDS) subsystem, for networks or hierarchies, or the Multics Relational Data Store (MRDS), for relational work in which the links between data fields are defined within the program rather than ahead of time.

Clearly an outgrowth of the Integrated Data Store (IDS/II) software introduced in late 1975, MIDS represents data relationships by means of record and set types, which can be searched and manipulated through procedure calls.

Schema, Subschema Support

Support for schemas that describe the data base and subschemas that represent user views provide the separation needed to protect the data and the user from each other, as one observer noted.

In addition to supporting schemas and subschemas, MIDS backs the opening of a data base for protected or concurrent update or retrieval, searching operations guided by "powerful" record selection expressions, and basic file maintenance facilities.

MRDS, on the other hand, represents data relationships by means of formal algebraic entities such as sets and relations; data base operations are precisely specified through expressions of first-order predicate calculus, Honeywell added.

In a relational approach, the interface between data base and user is achieved through use of a data model describing the base and data submodels describing various user views of the base, the spokesman explained.

MRDS users have a range of facilities similar to those of the MIDS user for opening, storing, updating and retrieving data from a data base, he added.

The complete MDBM rents for $683/mo., Honeywell said.

What Have You Done With DBMS?

A special report on data base management systems (DBMS) will be part of CW's Oct. 25 issue.

To make it as useful and interesting as possible, we welcome suggestions on topics to be covered and user-written articles describing experiences with the systems.

Writeups should focus on problems and solutions in any part of the user's expectations, selection process, implementation or use of the system once it became operational – or, if appropriate, why the project failed.

Contributions should not exceed 1,200 words (four or five double-spaced typed pages) and should be submitted by Sept. 30 to Don Leavitt, Computerworld, 797 Washington St., Newton, Mass. 02160.

Audits Check Fortran Compilers

WASHINGTON, D.C. – Created by the U.S. Navy's Software Development Office, the Fortran Compiler Validation System (FCVS) is intended to test compilers against the 1966 American National Standards Institute specifications for Fortran.

The FCVS – available shortly from the National Technical Information Service (NTIS) – consists of Fortran audit routines, related test data and an executive routine which prepares the audit routines for compilation and execution.

Each audit routine consists of series of tests of Fortran language elements and supporting procedures which indicate the result of executing these tests.

The system, therefore, is similar in concept and design to the Cobol Compiler Validation System which has been operational for some time, according to Dr. Paul Oliver, director of both the Navy Software Development Office and the Federal Cobol Compiler Testing Service.

Only Simplest Forms Used

Because the routines were designed to run on any computer purporting to support Fortran, the assumptions used to write the audit tests were very restrictive. Only the simplest forms of GOTO, arithmetic, IF, WRITE and assignment statements are used to write the support code required for each test, according to the user's guide being prepared for distribution through NTIS.

Since consideration of a revised Fortran standard is well underway, the validation system only tests conformance of those elements of the language which are "contained in the logical intersection" of the old and new standards, according to the guide.

Next Release Delayed

Acknowledging that Version 1.0 of FCVS is limited, Oliver said the next release, reflecting the entire standard, will have to await formal adoption of the revised standard – which is still out for public comment.

Just as Oliver's own organization plans to use FCVS on future Navy procurements, installations generally should be able to apply the audit routines to their own requirements he suggested.

NTIS has not yet assigned catalog numbers or prices to the FCVS tape or the user's guide, a spokesman noted from 5285 Port Royal Road, Springfield, Va. 22161.

RPG-II Offered for Interdata Systems

LEXINGTON, Ky. – An IBM-compatible RPG-II compiler for the Interdata Inc. 32-bit computers has been introduced by Software Innovations Corp. (SIC).

Almost any RPG-II source program can be handled by the compiler, which produces a CAL language source program, as output, SIC indicated.

The compiler also produces a source program listing, diagnostic messages and a symbol table list, the vendor said.

If no diagnostics are generated, the new source program is processed through the facilities provided by Interdata's OS 32-MT operating system and the resulting object program is available for normal execution.

If errors are detected, the compilation pauses. The user has the option of continuing if only warning messages were generated; on the other hand, if terminal errors were found, the program must be corrected and recompiled.

The independent's compiler is said to be source language-compatible with RPG-II for the IBM 3 with the exception of the file description specifications required to support the Interdata I/O devices.

Capable of working with sequential, indexed and direct file organizations, the SIC package runs on the Interdata 7/32 or 8/32 with disk, printer, program/system console and a minimum of 30K of main memory available beyond the operating system.

The compiler is available for $5,000 and the package includes SIC's Isam support, which sells separately for $650, according to the company at Suite 201, 160 Moore Drive, Lexington, Ky. 40503.

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Enhanced Software to Simplify Datasystem Upgrades

MAYNARD, Mass. – Software compatibility between all PDP-11 based Digital Equipment Corp. Datasystems at the language and data management levels was the design goal of a recently announced series of enhancements to DEC's business oriented operating systems, according to the firm.

For the larger Datasystem 500 users, the software – renamed the Commercial Transaction System (CTS) – extends the older system by adding transaction processing features, languages and language options.

CTS-500 features, for example, both single- and multikeyed indexed sequential (Isam) files for data management flexibility, a spokesman noted.

A data entry mode, Decform, allows a user to design data entry formats, run predetermined edits and process the data immediately or store for later use, he added.

The operating system for the Datasystem 350 has also been upgraded, DEC said. CTS-300 is available with a version of Decform that is fully compatible with the Decform implemented for the Datasystem 500 users. In addition, a data management system supporting single-keyed Isam capabilities has been made part of the software, the company said.

To simplify upgrades within the Datasystem family, CTS-500 now supports Dibol-11, a business oriented language previously available only on the Datasystem 300 as a standard product. Basic-Plus continues to be available as well, DEC acknowledged.

Available as options for the Datasystem 500 are a compiler for ANS Cobol '74, rated by DEC as Level 1+; ANS Fortran; Basic-Plus-2, an extended version of DEC's enhanced Basic with added data handling capabilities; and RPG-II.

The addition of RPG-II to the Fortran IV capabilities already available "makes change from traditional RPG-II systems to transaction-oriented operations easier than through any previously available means," DEC claimed without further explanation.

The CTS-500 package supports Decnet, DEC's networking protocol that allows communications links between Datasystems 300 and 500, PDP-8s and -11s and Decsystems-10 and -20. The Datasystems also operate with protocols that support communication between DEC systems and those of other manufacturers, the spokesman noted.

CTS-500 is scheduled for release in December; CTS-300 will be available in November, he added.

Fortran VI, Hardware Options Stretch Capabilities of 8/32s

OCEANPORT, N.J. – Interdata, Inc. has introduced three hardware and software enhancements to expand the capabilities of its 8/32 minicomputer: an optimizing Fortran compiler (supporting Fortran VI), single- and double-precision floating point arithmetic and a writable control store feature.

The new language is a superset of ANS Fortran '66 with a range of real-time extensions. It also has debugging facilities, the company said.

Dynamic and run-time options include Batch, which compiles programs in a batch mode; Test, which checks for subscript limits; and Trace, which allows variable tracing.

The high-performance floating point option – which can be used with Fortran VI – will be helpful for time-critical, real-time processes requiring substantial computation, the spokeswoman added.

Single-precision operations give 6.2 decimal digit accuracy and double precision goes to 15.2 decimal digits, she said.

The Writable Control Store enables users to create their own instructions, especially for commonly-used procedures.

Fortran VI costs $500; the floating point option, $6,500; and the writable control store, $3,000. All are available 60 days after receipt of order, Interdata said from 2 Crescent Drive, Oceanport, N.J. 07757.

Package Update Aids Financiers

PHOENIX – The release of Autotab II, recently announced by Capex Corp., contains improvements in three general areas within the financial planning, forecasting and analytical system, according to the vendor.

Designed originally to reduce the time and effort required to produce financial plans, Autotab II has been enhanced by adding greater flexibility to its report writing capabilities. This gives the user greater control over the format of the system's output, Capex noted.

Meanwhile, performance has been improved when Autotab II is run under IBM's VS operating systems, a spokesman added. This results in run times being reduced by as much as 15%, he claimed.

Beyond that, operational characteristics have also been improved for users running Autotab II under IBM's Time Sharing Option (TSO) of OS or the Conversational Monitor System (CMS) of the virtual machine facility, VM/370, allowing "easier and more effective use" of the Capex software in those environments, he added.

Autotab II generally is used in 80K to 100K bytes of OS storage, or under VS or CMS operations. It is available for a one-time license fee of $12,000 or for $460/mo under an annual lease.

Autotab II is also available on two major remote computing networks, Capex said from 2613 N. Third St., Phoenix, Ariz. 85004.

DP Vocabulary Group Seeks Canadian Help

REXDALE, Ont. – The Committee on Vocabulary of Data Processing, working under the Canadian Standards Association (CSA), is overburdened due to a lack of active members, according to a newsletter from CSA's Sectional Committee on Computers, Information Processing and Office Machines (Cipom).

The group has received some assistance from the Programming Languages Committee and the Data Communications Committee, but needs more help because of increased participation in international standards work and the "forthcoming adoption" of International Standards Organization (ISO) standards on vocabulary as CSA standards, the letter explained.

The next meeting of the vocabulary study group is scheduled for Sept. 15 at CSA headquarters, 178 Rexdale Blvd., Rexdale, Ont. M9W 1R3.

Another Text Editor Available for PDP-11

PALO ALTO, Calif. – Users working with Digital Equipment Corp. PDP-11 systems under the RSTS/E operating system have another line-oriented text editor to consider; this one from Ross Systems, Inc.

While Ross acknowledges there are other editors available for the RSTS/E environment, a spokesman claimed this product has advantages which include ease of use, response time and flexibility in the editing of Basic-Plus programs.

The package is available in source code – apparently Basic Plus – for a one time license fee of $1,400, Ross said from Suite 108, 1900 Embarcadero, Palo Alto, Calif. 94303.

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WANG

Hipo Charts, Pseudocode Called Good System Design Pairing

By Drew Bourrut

Special to Computerworld

There are some very good reasons for using the Hierarchy plus Input, Processing, Output (Hipo) documentation techniques.

Concepts and Techniques

Hipo charts are easy to read and are enormously helpful in designing a system. The fact they are easily understood by everyone from programmer to user is perhaps the most powerful reason for using them. While it is true they take time, I would not classify them as difficult to create.

Obviously the charts require a certain amount of skill and, prior to even attempting to create them, people involved should be adequately trained in their design concepts. Once properly trained, however, an individual should not experience an undue amount of difficulty in working with the technique.

We must realize the purpose of Hipo charts – just as with conventional flowcharts – is two-fold. First and foremost, they are tools to design a system and, as such, require a more than trivial degree of knowledge to be used properly. While it is also true they are aids to documentation, that purpose is only "after the fact."

The accompanying article was written in response to Joe Rigo's article, "'Son of Hipo' Proposed as Easier Charting Vehicle" [CW, Aug. 9], which, in turn, responded to an article by Ed Yourdon [CW, May 31].

The amount of drudgery involved in keeping the charts up-to-date depends upon how one uses Hipo. If one waits until a modification is completed before updating the particular Hipo chart or adding new ones, most certainly a lot of time is required to make the changes.

However, if the Hipo charts are made an integral part of the design phase of the modification, the time used in creating and modifying them is not only well spent, it may even shorten the programming and testing phases for the modification.

References made to automating the Hipo chart creation process disturb me greatly.

One of the biggest problems with conventional flowcharts has been that programmers and non-programmers alike have found them difficult to read. Attempts to automate the process of creating flowcharts have only made the charts more difficult to use; an automatically created flowchart is too dependent upon the excellence of the creation of the source program.

Since their primary use should be to aid in the development phase of a project, this is an unreasonable demand.

If we understand the purpose of Hipo charts as aiding in the design and documentation of a system, we must also realize that to eliminate or minimize the human element when we design or document a system is to make human-computer interaction just that much more difficult.

Pseudocode Recommended

An additional point: Although Hipo charts are excellent at showing the function of the system at all levels, many programmers still rely on flowcharts for the actual logic involved in creating their source program code. I suggest that pseudocode should be used instead, for that part of the development cycle.

Just as Hipo aids in the structured design of a system, pseudocode aids in the structuring of a program. Further, pseudocode may actually help the programmer catch bugs in his logic.

For example, during a course I recently taught, I had given entry-level programmers a logic problem for homework that required the students to flowchart and pseudocode a solution. One student chose to do her flowchart first. After creating what she thought was a correct solution, she attempted to write the pseudocode while referring to the

(Continued on Page 14)

'Assist' Now B&B 'Resolve'

SUNNYVALE, Calif. – Boole & Babbage, Inc. (B&B) has acquired the rights to the Assist package from Advanced Software Techniques [CW, Nov. 11] and is now marketing an enhanced version under the name Resolve.

The package provides more than 30 operator and authorized TSO user commands, each of which addresses a specific problem which causes system downtime or restarts (IPLs).

Resolve displays paging rates, shows job queue use, provides for deadline management by permitting internal dispatching priorities to be changed by operations, shows free core and lists jobs being held up, the company continued.

In addition to the standard services provided by Resolve, an option provides users with a means of creating macro instructions to cope with situations that may be peculiar to an installation. B&B has said it will make these user-developed services available to all Resolve users if the originator is willing.

The package operates as a real-time problem program in a 16K region. It includes password protection for all user services, operates with OS, OS/VS, Asp and Hasp environments and can be run continuously as an adjunct to the operating system or initiated when problems are encountered.

Resolve can be purchased for from $5,400 to $10,800, depending on options and operating system. Monthly rents range from $170 to $450, B&B noted from 850 Stewart Drive, Sunnyvale, Calif. 94086.

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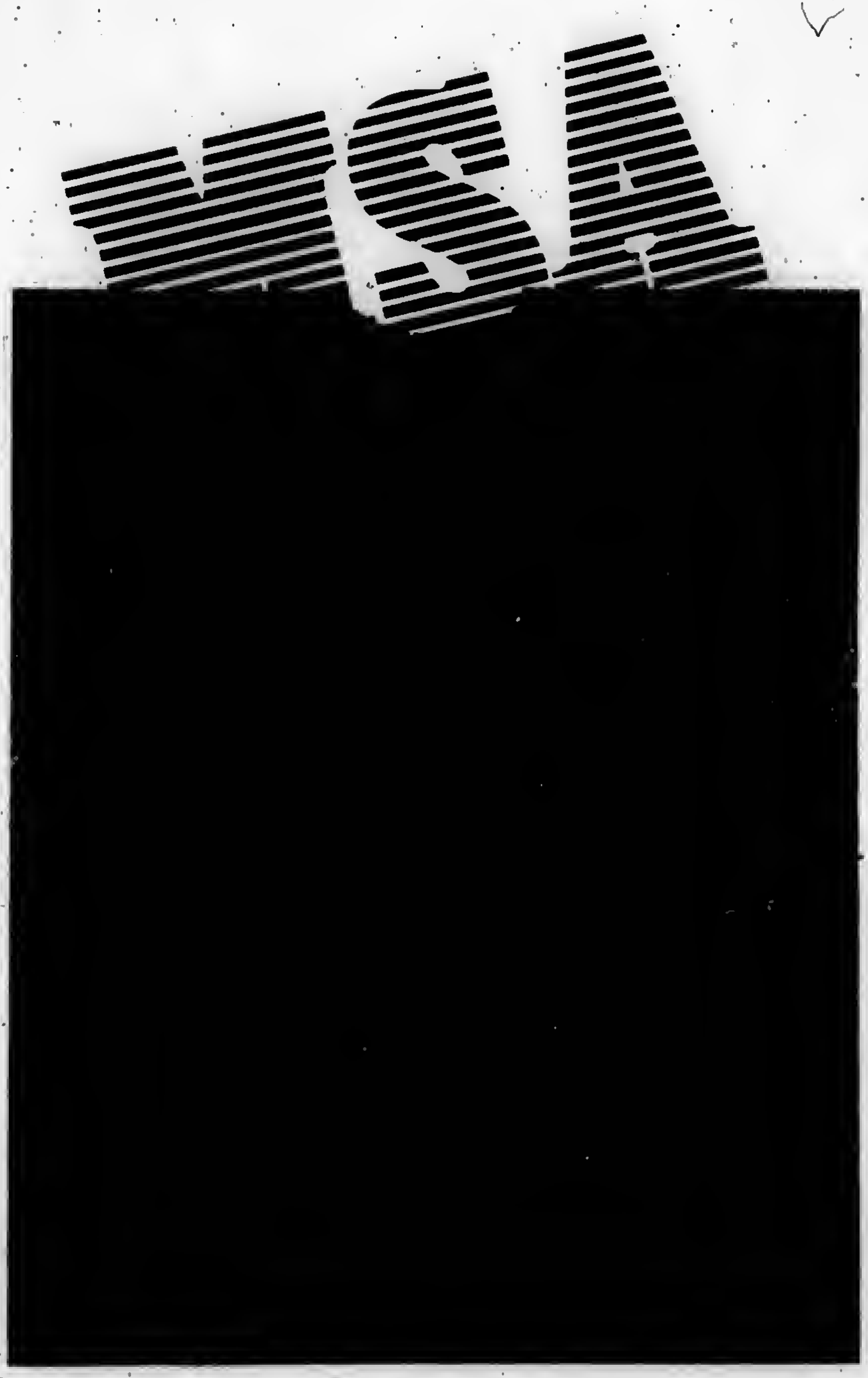

Even Teams May Not Help

Too Much Expected of Today's Analyst, Meeting Told

By Don Leavitt

Of the CW Staff

ALEXANDRIA, Va. – Employers expect far too much from systems analysts as individuals. Even when they recognize that and attempt a team approach, they expect too much from their systems teams, according to an analyst with the U.S. Bureau of the Census.

However, awareness of the problem and a willingness to change the involvement and skill levels of the people concerned can bring sense out of this chaos, Paul D. Oyer added.

Addressing a recent symposium on the Systems Analyst in Perspective, Oyer said the problem has arisen because the "interdisciplinary functions of systems analysts are rather unique in the history of man and his traditional organizations."

The Human Connection

The functions of the analyst "must delve right into (and often must change) the interdepartmental and interpersonal exchanges of information...When a computer goes down, or the system design has flaws, entire organizations can come to a standstill."

"The systems analyst has a much tougher environment and image problem than any other profession we can name," he continued. He cited a study by the American Federation of Information Processing Societies (Afips) which identified 300 job tasks the "typical" analyst performs regularly.

That kind of function is "usually too big for one person" and requires a team effort because organization management "needs to make sure" that all tasks pertinent to its needs "are actually performed by someone to assure successful information systems," he added.

New Perspective

The perspective as well as the workload of the analyst must be changed if the work is to be done well, Oyer said. He described an in-depth study of the year 2000 recently undertaken at the census bureau.

That exercise looked far enough ahead so that participants could divorce their thinking from all present constraints. The analyst in any situation "should be able to exercise the same type of thinking in analyzing and designing a new information system," he said.

By ignoring present restraints, the analyst can develop a sound logical design which can best perform the objectives of the new system. After that, one can translate the design into what is realizable in available technology, methods and money.

Without that future perspective, Oyer added, "new systems look almost exactly like old systems because very little improvement is made."

In his projections of the systems team of the future, he saw five types of analysts, including the computer itself. The information analyst "needs to spend more time as a team member interfacing with the user and the computer systems analyst," he said.

"The computer systems analyst needs to 'grow up,' " he added, and "the programmer needs to broaden his perspective."

The user needs to get more deeply involved throughout the system life cycle and be made responsible, Oyer noted. "All of the analysts need to use the computer more as a modeling tool to help them make better analyses and better design and development decisions."

ASI Courses Cover Time Sharing Option

ELK GROVE VILLAGE, Ill. – Advanced Systems Inc. (ASI) has designed a videotape training course covering the facilities of IBM's Time Sharing Option (TSO) in the OS/VS environment.

Six videotapes, a student guidebook, a coordinator's guide and four audio tapes make up the course. Total student involvement is between 17 and 20 hours, ASI estimated.

The course is said to give special attention to commands such as LOGON, LOGOFF, EDIT, HELP, TEST, SAVE, LIST and RUN. The use, creation and modification of data sets are also discussed. As a reinforcement, each unit includes an optional hands-on terminal exercise, a spokesman noted.

TSO, The OS/VS Time Sharing Option is available on half-inch reel-to-reel and three quarter-inch cassette videotapes. Other formats, including film, are available under special arrangements.

The course is part of an 800-title library available under direct-purchase or rental plans, ASI said from 1601 Tonne Road, Elk Grove Village, Ill. 60007.

Hipo and Pseudocode Called Good Pairing

(Continued from Page 13)

flowchart.

Very quickly she got bogged down. She had a minor bug in the flowchart which simply could not be expressed in pseudocode. When I suggested she attempt the pseudocode again while only referring to the problem specifications she found, she was able to create a logically correct solution in a very short time.

While Hipo and pseudocode may not make a bad design better, the combination certainly will allow people to create better designed systems and may catch a bad design before it is too late to change it.

From my point of view the rule should be: Hipo instead of systems flowcharts and pseudocode instead of program flowcharts.

Bourrut is president of Bourrut Consulting Corp., Smithtown, N.Y.

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Label for Style Debatable But...

Readers Agree, Best DP Managers Work With Others

By Jack Stone
Special to Computerworld

Following are two of several letters I received in reaction to my article on "egoless leadership" [CW, July 19]. These differ from each other in tone, but generally seem to reach the same conclusion I did.

Dear Mr. Stone:

Open your eyes to the leading edge of the industry. DP management is experiencing a radical change in both its accountabilities and relationships to top management.

DP managers are finding themselves aurrounded by a myriad of what used to be buzz words, but have since turned into real accountabilities. Computer performance; programmer productivity measurement; communications network security and control; software and date security design . . . the list goes on.

Each of these topics can have a significant effect on the total organization, not just DP. These highly technical areas do not share the same characteristics typical of traditional management accountabilities, yet DP managers are finding themselves on the carpet over some of these issues.

Readers are invited to write to Stone, c/o Computer Education International, Inc., Suite 222, 2233 Wisconsin Ave. N.W., Washington, D.C. 20007, outlining questions, issues or situations pertinent to human relations and personnel management.

Letters should not exceed 350 words and should include the name, title, organization and address of the sender, although this information will be withheld from publication unless authorized for release by the sender.

Top management is no longer tolerating "being kept in the dark." The trend is turning toward national, systematic justification for resource expansion; long range planning; concrete objectives and measurement criteria.

Top management is becoming more and more aware that the corporate DP facility is nothing more than a sophisticated resource and that the DP managers are responsible for controlling all aspects of that resource.

Your article may have been pertinent two years ago, but times are changing. The executive suite is suddenly demanding what it should have been getting all along. You call it "egoless leadership", I call it good professional resource management.

Fortunately or unfortunately, some DP managers will not make it through the transition. They will still be talking nanoseconds and transfer rates as they empty out their desks. However, the true professionals will preside.

I take my hat off to top management for putting their foot down and demanding reasons and results.

Hugh Smallwood
Operations Manager
Alexander & Alexander Inc.
Baltimore, Md.

Our Fate, Our Fault

Dear Mr. Stone:

I just finished reading your article about "egoless leadership." I couldn't agree with you more. I have been in the programming business since 1952 and your article hit the nail on the head.

Why does this situation exist? I'm not really sure, but I have seen it many times, and like most problems or arguments there is something to be said for both sides, We must admit however that each one of us is responsible for his or her own fate, and if we, as a class of workers, stop short in career advancement, it is our fault, not anyone else's.

Let's be frank. Many people in our business deliberately draw the cloak of mystery about what they do.

I have seen programmers deliberately put a "bug" in their programs so, periodically, they would get an emergency call when their program failed to work. They would rush to the computer room, spend a few minutes in a corner performing their "magic" (resetting a counter to zero, I suspect) and then accepting the plaudits of all who witnessed this great performance.

In addition to an ego trip, the programmer had job security. What more could one want?

This situation is not a case of someone being morally right or wrong. We have no problem of ethics or conscience here, so we can safely apply the rules of pragmatism. It's up to us to make higher management want us in their exclusive club. We won't force our way in. History has proven that can't be done. We have to give them what they want. We can't go on being different and expect to be admitted.

The Human Connection

Unless and until DP personnel raise their sights and broaden their viewpoints beyond the confines of the computer room, that's where we will stay. In other words give the boss what he wants, not what you think he ought to have.

It is very unlikely top brass will see it any other way than the way they do now. They don't have to, they are the bosses. We have to do it their way or stay in place where we are. It is too bad that, in spite of the great ability and creativity we find in the DP groups, most will stay there and go no further.

It may well be ego satisfying to be looked upon as a magician who is different. When it cuts short career development and advancement, I suggest we look within ourselves and decide if the price we pay for this ego trip is really worth it in the long run. Personally, I don't think it is.

William A. Delaney
President
Analysis & Computer Systems, Inc.
Burlington, Mass.

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Ed Yourdon and Jerry Weinberg will be examining these and other questions at five one-day State-of-the-Future Conferences in cities across the country the week of September 20th (see box below for dates).

Both of these dynamic thinkers have some very strong views on the subject.

Views that have been tempered by ten years of experience as leaders of the "structured revolution."

Yourdon is the author of *Techniques of Program Structure and Design* and *How to Manage Structured Programming.* And co-author of *Structured Design* and *Structured Programming in COBOL.*

Weinberg is the author of *The Psychology of Computer Programming* and *An Introduction to General Systems Thinking.*

State-of-the-Future Conference Dates	
Washington	September 20th
New York	September 21st
Toronto	September 22nd
Dallas	September 23rd
San Francisco	September 24th

The conference will consist of four major presentations by Yourdon and Weinberg. There will be discussion periods after each session.

Each conference participant will receive a copy of Weinberg's *An Introduction to General Systems Thinking,* and Yourdon and Constantine's *Structured Design.*

Specifically, Jerry Weinberg will speak on *General Systems Design* — the discovery of the deep principles that will chart the course of future design. His second talk will revolve around the subject of *Responsive Design* — a philosophy of designing computer systems that adapt to the idiosyncrasies of people rather than having people adapt to the idiosyncrasies of the computer.

Ed Yourdon will speak about *Structured Design* — the application of general systems theory to the design of computer programs and systems. Coupling, cohesion and design strategies based on data flow and data structure will also be covered. Yourdon will also talk on the subject of *Evolutionary Design* — the concept of integrating the analysis, design and implementation of a computer system as a series of "top-down" versions.

If you wish to attend the State-of-the-Future Conference please fill out the coupon below. But, hurry. Reservations for this one-day trip into the future are limited.

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COMMUNICATIONS

Data Briefs

Asynchronous Multiplexer From STC Fits DG Minis

MAYWOOD, N.J. – STC-Systems, Inc.'s asynchronous multiplexer board for Data General Corp. minicomputer users includes eight asynchronous communication I/O channels, a line printer controller and a real-time clock, the firm said.

The multiplexer, on a single printed circuit board, allows for the installation of up to 64 asynchronous channels in one processor. Each channel is RS-232C-compatible and will interface to local terminals or data sets in half- or full-duplex operation.

Eight different transmission rates, from 110- to 9,600 bit/sec, are jumper-selectable, it noted.

The parallel printer controller interfaces with Dataproducts, Inc., Centronics Data Computer Corp. and Tally Corp. line printers.

Cabling from the back plane of the processor to a connector junction panel is provided with each board, it added.

The board costs $2,995 from STC Systems Inc., OEM Products Group, 9 Brook Ave., Maywood, N.J. 07607.

Omnitec Coupler Fits DEC Terminal

PHOENIX – Omnitec Corp. has designed an acoustic coupler to operate exclusively with the Digital Equipment Corp. LA-36 terminal.

The Model 503A reportedly provides the performance and flexibility necessary for conversational time-sharing of a remote computer system.

Features of the coupler include LSI circuitry, half- and full-duplex capabilities controlled by the LA-36, a carrier indicator light and a three-minute installation time, Omnitec claimed.

The 503A costs $245; quantity discounts are available, the spokesman said from 2405 S. 20th St., Phoenix, Ariz. 85034.

Bit-Interleaved Multiplexer Bows

WILTON, Conn. – General Datacomm Industries, Inc. has a bit-interleaved multiplexer, the TDM 1251, designed for synchronous data communications networks.

The unit provides the capability to configure networks of various speeds to gain maximum economy and flexibility from currently available and planned common carrier services, including ultrahigh-speed digital networks, according to the company.

A typical system with 10 synchronous channels costs $4,900 from the firm at 131 Danbury Road, Wilton, Conn. 06897.

Despite 10 Objections

SBS Claims Hearings on Plan Not Needed

By John P. Hebert
Of the CW Staff

WASHINGTON, D.C. – Satellite Business Systems (SBS) recently asked the Federal Communications Commission (FCC) to approve its entry into the domestic communications satellite field without further delays from FCC proceedings.

The more than 300-page SBS filing came in response to formal objections to the IBM, Comsat General Corp. and Aetna Casualty and Surety Co. joint venture from about 10 organizations in the last few months, including the Justice Department, Western Union, RCA, AT&T and the Computer Industry Association (CIA) [CW, June 14].

The partnership is presently expecting delivery of equipment it has already ordered to begin development of preoperational network installations, an SBS spokesman said.

Promote Public Interest

In its response, SBS said it had proposed a domestic satellite system that would promote the public interest by serving private network communications requirements and foster a procompetitive environment through the use of new systems concepts and techniques.

In addition, SBS said, its present applications with the FCC already provide detail, equaling or exceeding the quantity of information the commission required in granting initial authorization to carriers now providing domestic satellite services.

The waiver of further FCC proceedings would allow SBS to begin preparations necessary to enter the first phase of its preoperational network plan, the SBS spokesman noted.

This first phase involves a six-month test of modulation and multiple-access equipment and simulated communications traffic only, which will be used in the proposed network operating at the 12/14 gHz frequencies, he said.

SBS has already awarded a contract for delivery – by the end of this year – of two 42-ft-diameter, deep-dish microwave antennas and has chosen the installation sites on IBM premises in Poughkeepsie, N.Y. and Los Gatos, Calif..

A second phase of the SBS satellite communications network would deal with actual common carrier service traffic for IBM internal business only, he said. The network is tentatively scheduled to become fully operational in 1979.

An evidentiary hearing such as opponents to the network urge, SBS said, would postpone the partnership's plans and thereby increase the risks which SBS already faces in entering the field.

In addition, it would advance the private interests of the other carriers and stifle the benefit of competition. it said.

Industry apprehension has been expressed in reaction to the proposed venture on grounds that IBM may be able to gain a hardware edge and, as a result, a lock on the domestic satellite communications industry because of a possible introduction of incompatible interfaces.

These fears are unfounded, the SBS spokesman indicated, because SBS has taken every precaution to comply with FCC rules in its application, which would prohibit such an outcome.

Jack Biddle, executive director of the Computer and Communications Industry Association (CCIA – formerly CIA) stated although the SBS response provides verbal assurances, there is "no firm commitment to ensure users will at all times be able to attach equipment to the network on a nondiscriminatory basis."

The fear is, Biddle remarked, for IBM to concurrently come out with a new equipment generation so that only IBM equipment would be attractive to the network.

Biddle said he would like to see a proviso from the FCC for a rule of violation that would cause the tariff granted to SBS to be null and void.

It would be very hard to halt the operation of the SBS network plan, once FCC go-ahead is given, Biddle explained.

"The SBS network can be innovative and good for the country as long as no games are played by IBM," he said.

IES Adds Intelligent Data Entry Terminal

SEATTLE – International Entry Systems, Inc. (IES) has introduced an intelligent remote-batch data entry terminal for input of bulk accounting data.

The Datacorder is described as a self-contained "intelligent" terminal utilizing a microprocessor with 8k of random access memory storage, which can be expanded to 12k, IES said.

Data is entered via a full alphanumeric keyboard with calculator pad. Messages and keyed input are displayed on a 32-character electronic display. All data is stored on a Phillips-type cassette using a digital cassette recorder. A journal tape is provided to give a printed audit trail.

Prices for the Datacorder range from $3,970 to $5,875, depending on configuration. Delivery takes 60 days IES said from 408 N.E. 72nd St., Seattle, Wash. 98115.

Multiterm T-3000 Features Microprocessor, Diagnosis

REDONDO BEACH, Calif. – Multiterm Corp. has announced a data communications terminal controlled by an 8080-type microprocessor, which is capable of print speeds up to 45 char./sec.

The company said the T-3000 utilizes the Diablo HyType II print mechanism, which, like the logical circuitry, memory, microprocessor and power supply, are contained in the desktop unit.

The T-3000 is supplied with an RS-232C, 25-pin interface connector and Ascii communications, Multiterm said.

An IBM Selectric-type keyboard is complemented by a 10-key numeric pad and function keys, it said, adding a Scroll On feature allows the operator to view the print on each line by automatically rolling the platen up one line when the terminal is in an idle state.

Self Diagnosis

In addition, the unit has the ability to self-diagnose internal problems through error message printing indicating whether the problem is internal or in the communications from the host computer system.

The T-3000 costs $2,875, with quantity discounts available, Multiterm said from 2612 Artesia Blvd., Redondo Beach, Calif. 90278.

Peripheral Adapter Connects 3 Devices

PHOENIX – United Data Services Co., Inc. (UDS) has introduced a peripheral equipment adapter designed to increase the capabilities of CRT and keyboard printer terminals in local or remote locations by adding auxiliary peripherals to them.

The $135 adapter allows up to three terminal devices with either RS-232 voltage or 20 mA current loop interfaces to be connected to a single EIA-compatible port, modem or multiplexer channel, the company said.

UDS is located at 3024 N. 33rd Drive, 103, Phoenix, Ariz. 85017.

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For Remote Data Communications

CDC Adds Series of Interactive Terminal Products

MINNEAPOLIS – Control Data Corp. has introduced a series of computer terminal products intended for remote, interactive data communications.

The CDC products include a microprocessor-based display terminal subsystem with associated cassette tape storage units and impact and nonimpact printer terminals, CDC said.

The CDC 751-10 display terminal is an asynchronous remote device controlled by an Intel Corp. 8080 microprocessor. It displays 1,920 7 by 9 dot matrix characters in a 24-line by 80-character format, the company said.

A complement of 128 different characters is displayed on the 751-10's CRT screen, including 95 Ascii characters and representation of 33 Ascii control codes, it said.

Character and control code keys are arranged in a typewriter-style layout on a detachable keyboard, which can be located up to 2 feet away from the display, CDC added.

The 751-10 connects to a customer-supplied external, asynchronous modem and supports RS-232-C or CCITT V24 communications interfaces, a spokesman said.

Ten half- or full-duplex data transmission rates from 110- to 9,600 bit/sec can be switch-selected from the display unit.

Preprogrammed microprocessor firmware also allows odd, even, mark or space parity to be selected by the operator, as well as data transmission in character, line or block modes, he added.

Plug-In Module Option

A plug-in module option allows the CDC 751-10 to operate in a polled, multidrop terminal environment with up to 95 other 751-10 devices on a single communications line, he said. Other modules are said to provide current loop operation and answerback capability.

The CDC 753-10 nonimpact printer is a table top unit connected to and controlled by the 751-10 display's microprocessor – which prints single copies of data transmitted from various external sources at the direction of the microprocessor, according to the spokesman.

Print speed is up to 30 char./sec in an 80-column line on continuous-roll, heat-sensitive paper. Characters are spaced horizontally 10 column/in. and operators can select vertical print spacing of either three- or six line/in.

Higher speed, multiform printing of information is provided by the CDC 755-10 impact printer..

This unit handles one-to-five part, 4- to 16.75-in. forms and provides constant visibility of the last line printed, he claimed. Printing is accomplished at speeds of 173- or 180 char./sec, depending on whether U.S. or European power sources are used, he said.

Local data storage for the new terminal subsystem is provided by CDC 754 single and dual tape cassette units. Connected to the microprocessor controller, these drives operate on- and off-line simultaneously with other subsystem peripherals and a host computer system.

Data is stored on both sides of the cassettes in 120-character records. A capacity of 1,200 records per side provides total storage of 288K and 576K characters of information on single and dual drives, respectively. Phase-encoded data density is 780 bit/in, and tape speed is 7.5 in./sec.

Purchase price for the CDC 751-10 microprocessor-controlled terminal display is $3,150 and the unit can be leased for $93/mo on a three-year contract. The CDC 753-10 nonimpact printer can be purchased for $2,540 or leased for three years at $74/mo, he said.

Purchase and lease prices for the CDC 755-10 impact printer are $4,370 and $126/mo, respectively. The single and dual tape cassette units carry purchase prices of $2,200 and $2,520, respectively; they lease for $70 and $79/mo, respectively, he added.

Customer deliveries of the terminal units are scheduled to begin in October 1976, with quantity discounts available on all products, he said from Minneapolis, Minn. 55440.

Dynatech Announces Data Communications Test Setting Device

ALEXANDRIA, Va. – Dynatech Laboratories, Inc. has added a preprogrammed microprocessor-based data communications test set to its line of technical control equipment.

The TC-100 tester's standard program allows the unit to perform varied trouble-shooting duties to locate and define faults in a communications system, a spokesman for Dynatech's Cooke Engineering Division said.

It can simulate and test all components of the data network, including communications circuits, modems, terminals and computer ports, the company said.

In addition, the TC-100 is able to test areas such as the system software, communications protocols and answerbacks, the spokesman said.

The unit is able to handle "any line between two modems," regardless of transmission speed, the spokesman said.

Standard test speed capabilities go up to 9,600 bit/sec, but data traveling st higher speeds can be evaluated through utilization of an external clock input, he added.

Two different test patterns can be generated by the TC-100 for bit error rate testing. The unit allows the user to store and check a "trap character" plus 32 characters on either side via a step-through memory, the spokesman said.

Two versions of the TC-100 are available – a rack-mount version and a portable version.

The rack-mount version costs $3,300. A similar portable unit is priced at $3,600 and includes the additional EIA interface breakout features.

Dynatech's Cooke Division is located at 900 Slaters Lane, Alexandria, Va. 22314.

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For Both Voice and Data

Computer Controls Corporate Communications Costs

By John P. Hebert
Of the CW Staff

GREENVILLE, S.C. – A combination of heavy voice and data communications traffic and an inability to keep track of calls made from the central offices of a large engineering and construction company for billing purposes has led to computerizing the control of corporate communications.

Daniel International's communications problem was not unique, except in terms of the extravagant time and money spent to support its information network.

Telephone bills in excess of $30,000 each month were the result of requirements to coordinate the activities of seven sales offices within the continental U.S.; seven subsidiaries and 200 to 300 construction projects, some of which utilized computer terminals to provide project data; and input payroll information for Daniel employees.

A parallel situation of attempting to manually keep track of each of 15,000 individual calls made per month was "such a nightmare that we don't want to remember it," Snowdon Parlette, Daniel's director of management services, said.

Even though the company had Wats lines, Parlette said, it was "absorbing all kinds of losses. Clients wouldn't pay for calls made through the network "because they were billed two or three months after a construction project was finished," he explained.

Moreover, part of Daniel's 15,000-call monthly volume included a DP load of one million to one and a half million lines of printed output per week from computer terminals located at some of the firm's larger ongoing construction sites, according to Ralph Ogden, vice-president of computer and management services.

In short, Daniel needed a way to prevent absorption of communications costs which should have been billed to the client.

Terminal Transactions

A "hard dollar" savings of $4,500/mo, plus the added benefit of reduced clerical activity once needed to identify communications traffic, was realized with a Data General Corp. Nova minicomputer-controlled Watsbox, made by Action Communication Systems, Parlette said.

The Watsbox is a "fully active system," he said. Each Daniel employee must dial certain codes to initially gain entrance to one of the 22 Wats lines. Then the Watsbox looks for the cheapest available circuit to reach the desired destination and checks the system for malfunction.

A small disk on the device records all calls made and transfers them to magnetic tape periodically. The tape, Parlette said, is processed on one of Daniel's dual Honeywell Information System (HIS) 635 mainframes for purposes of client billing. Clients are billed at the direct-distance dial (DDD) rate, he said.

Because the company is looking after an international market and because of an increase in data communications through the company's Wats lines, the box will help the firm control the communications costs associated with corporate expansion, Ogden indicated.

Preparing for Additional Lines

At present, Daniel is preparing for the addition of RCA communications lines to Puerto Rico and the installation of Sycor Corp. models 350 and 440 intelligent CRT terminals, Ogden said.

Those terminals will be an addition to Daniel's network of about seven or eight HIS Keytape terminals and six Sycor 350s and 440s at construction sites in the continental U.S., which comprise 5% to 10% of the company's communications traffic, Parlette and Ogden agreed.

Even though some of the volume of data traffic passing through the remote terminals at large projects calls for using dedicated lines (and in one case splitting a 9,600 bit/sec stream into one 4,800 bit/sec and two 2,400 bit/sec lines), the terminal transactions pass through the Watsbox.

No Problems

There are no problems running 2,400 bit/sec data traffic through the box; which ultimately interfaces with the dual 128K and 64K crosswired HIS 635s, Ogden said. Standard Bell 201C modems are used, except in the case of a multiplexer for the 9,600 bit/sec leased line, he explained.

Process control and payroll data coming in from terminals at the construction sites is processed here with overnight turnaround, he said.

Because all calls are now billed within days of the call date, as opposed to months under the old method, cash flow has improved, client billing costs are reduced, and company management is able to identify and rectify telephone call abuse, Parlette indicated.

HI Plotter Interfaces To CDC 734 Terminal

AUSTIN, Tex. – Houston Instrument (HI) has introduced a plotter interface designed to provide users of Control Data Corp. 734 batch terminals with plotting capability.

The Complot BTC-7/734 plotter interface is said to provide automatic plotting directly from the host computer at speeds from 450 step/sec for the DP-1 digital plotter to more than 2K step/sec for the DP-8 digital plotter.

The device features microprocessor-controlled plotting with vector and character generation, according to the firm.

It can be field-installed in less than 30 minutes, costs $2,595 and has a delivery schedule of 90 days, the HI Division of Bausch & Lomb said from One Houston Square, Austin, Tex. 78753.

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Synchronous Line Driver Bows

PALO ALTO, Calif. – Prentice Corp. has a synchronous line driver (SLD) which is said to be capable of providing synchronous data communications at speeds greater than 19.2K bit/sec over nonloaded multigauge cable.

The device operates over common loaded multigauge cable at transmission rates in excess of 4,800 bit/sec. It is said to provide users full utilization of terminals, CPU ports and transmission lines.

Diagnostic Capabilities

Each SLD incorporates diagnostic capabilities, including local and remote loopbacks, nine diagnostic LED indicators and a pseudorandom word generator for self-testing, Prentice said.

The unit's transmission distance ranges up to 25 miles, the company added.

It is capable of operating over either two- or four-wire lines in either half- or full-duplex modes, as well as in a polled environment, Prentice said.

The units have a digitally generated sinewave output allowing the SLD to conform to Bell Specification #43401, the firm said.

They use CMOS technology and to assure stability a crystal oscillator is employed for both signal generation and system timing.

The units are modular for compatibility with existing dial or lease line hardware. Up to eighty-eight fit into a P-1000 cabinet from the firm.

The line driver costs $490. No test equipment or adjustments are required for installation, Prentice noted from 795 San Antonio Road, Palo Alto, Calif. 94303.

GE Adds Terminet Controller To Its Family of Line Printers

WAYNESBORO, Va. – General Electric's (GE) Data Communications Product Department has introduced a factory-programmed processor-based communications controller for its family of Terminet line printers.

The Terminet 9600 controller includes the processor, memory system, power supply and I/O interfaces and can be used with Terminet 120, 310, 320, 330, and 340 communications terminals, GE said.

It can handle synchronous or asynchronous data transmission up to 9,600 bit/sec. It is compatible with different communications protocols emulating the IBM 2780, 3780 and Univac DCT-1000 for use on GE's Mark III time-sharing service, the company said.

The 9600's memory is composed of preprogrammed electrically-programmed read-only memory (Eprom), 1K bytes of random access memory for data storage and 32 bytes of jumper programmable read-only memory, intended for station identifiers or answerbacks, a GE spokesman said.

The 9600 appears as a hard-wired device to the user, he added.

The firmware control program in the Eprom is executed by the processor and is nonvolatile, GE said.

A self-test card is said to provide an evaluation of controller logic. The self test isolates faults to a memory card and gives a visual display of system status, the company said.

The 9600's I/O interfaces are asynchronous, synchronous and parallel, it added.

The 9600 costs about $3,000 and performance can be upgraded without changing communication software, GE said. In addition, there is an installation charge of about $200 for field upgrades, the spokesman said from Waynesboro, Va. 22980.

GTS Introduces Two Batch Terminal Units

DALLAS – General Terminal Systems, Inc. (GTS) has introduced two intelligent batch terminal models to serve distributed DP users:

The two units, the GTS 5030 and the GTS 5040, are built around the General Electric (GE) Terminet 9600 communications controller.

Including a Terminet 320 line printer and 300 card/min reader, the GTS 5030 is suited for 2,000- and 2,400 bit/sec line speeds.

The unit, which includes an IBM 2780 emulator, is priced at $12,900, the company said.

The GTS 5040 is capable of 4,800 bit/sec transmission speeds and contains hardware similar to the 5030, it said. A GE Terminet 340 line printer is included with the terminal which is priced at $14,900.

Immediately available, maintenance on the units is provided by GTS and third party service companies in some areas, GTS said from Suite 416, 13777 N. Central Expressway, Dallas, Tex. 75243.

Digi-Log Announces Character Set Option

HORSHAM, Pa. – Digi-Log Systems, Inc. has an upper/lower case character set for its Telecomputer II CRT display terminal.

Compatibility with teletypewriters and time-sharing systems is maintained by a keyboard switch that permits the user to alternately select upper-case-only operation, the company said.

The upper/lower case character set option is available with all configurations of the Telecomputer II for $250, it added.

The Telecomputer II can use any television monitor for its visual output and up to 10 different monitors simultaneously.

On the Telecomputer II the line length can be switched between 40 and 80 char., the firm said.

The operation can be switched between half and full duplex and the speed of operation can be switched from 50 to 9600 bits/sec, while the CRT can be made to roll or fill as a page.

To satisfy other users needs, the Telecomputer is offered with optional features, such as cursor addressability, format control and blink. The basic model sells for $1,295, the firm added.

DigiLog is located at Babylon Road, Horsham, Pa. 19044.

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Cooperative Effort

Network Alleviates Farmers' Guesswork

By John P. Hebert
Of the CW Staff

LINCOLN, Neb. – A cooperative computer effort between the University of Nebraska (UN-L) here and the Nebraska state government is helping Nebraska's farmers take the guesswork out of food production.

Although the Agricultural Computer Network (Agnet) system is used by farmers, its unique multidisciplinary approach allows it to be used by researchers, agricultural extension specialists, teachers and students in agriculture and home economics at the university, according to Dr. James Kendrick, professor of agricultural economics at UN-L and codirector of the Agnet program.

The system also serves the UN-L Institute of Agriculture and Natural Resources staff and Nebraska agricultural interests, Kendrick said.

Computer terminals are located in some of the state's more than 90 county district offices and used not only by farmers, but also by the news media to obtain answers to crop problems and publicize them throughout the state, Kendrick explained.

There is a great interest among the state's farmers for the information contained in Agnet on one of the dual IBM 370/158 mainframes operated by the State Department of Administrative Services, Kendrick noted.

"Big agriculture today is a sophisticated business run by highly trained individuals," he explained. "Agnet permits them to make sharper management decisions."

"Agnet tells farmers why they will make or lose money under a given set of user-defined assumptions," Kendrick noted. "This is another example of a computer helping businessmen, which is what farmers are," he concluded.

Preliminary estimates of Agnet's value in aiding farmers, he said, amount in savings between $3 and $5 per ton on mixing feed or an estimated 40% savings in the energy costs associated with irrigation methods, for example, with other benefits unable to be quantified.

The system helps solve the critical problems in farming, such as the per acre cost of a surface or center pivot irrigation system or cattle feed rations to meet the best nutritional requirements. In addition, the time-sharing system makes available ten years of weather information for various points in the state.

"Agnet's value is its ability to help the user ask the 'what-if' questions" related to farming, Dr. Thomas Thompson, professor of agricultural engineering and also codirector of the system, said.

The state's 2M byte IBM 370/158, which includes 44 spindles of IBM 3330 disk drives, divided equally between two Model 11s, holding 200M bytes of data each, and Model 1s, with 100M bytes, provide the information base for Agnet. John Leesley, state technical services manager said.

Data is queried from a number of different types of terminals at the district offices. These include Computer Transceiver Systems, Inc. Executports and Computer Devices, Inc. Teleterms, Leesley said.

The system utilizes two 300 bit/sec incoming Wats lines for out-of-state users which initially terminate at two ports on a Bell System modem. An additional 20 ports from the possible 48 dial-up lines feed into the modem on a local telephone number accessed by the university, Leesley said.

Front-end transmission line control is handled by an IBM 3705 processor managing a total of 36 dial-up lines used by the Agnet system and for other state applications, he said.

Agnet has already spent 18 months in a pilot stage and has completed a three-to-five month intensive use period where it has been "delivered widely" to people concerned with agriculture in the state, Kendrick said.

UN-L is presently treating the system as an educational and research tool, Kendrich added.

GDC Adds Extension Unit

WILTON, Conn. – General Datacomm Industries, Inc. (GDC) has introduced the GDC/AEU-1 which features analog (modem) extension of Bell Digital Dataphone Service (DDS) circuits.

The unit also provides analog extension of unbuffered multiplexer output of a higher speed modem, positive frequency and phase lock to either DDS or high-speed modem clock.

Advantages include analog (modem) access to locations not served by DDS, the firm said.

The GDC AEU-1 acts as a phase correcting interface buffer between two synchronous devices. It may be used between a DDS Digital Service Unit (DSU) and a synchronous modem, or between an unbuffered multiplex port of a high-speed (9,600 bit/sec) synchronous modem and a synchronous modem operating at the speed of the multiplexed port.

The unit costs $300 from General Datacomm Industries, Inc., 131 Danbury Road, Wilton, Conn. 06897.

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Using case studies, round table discussions and workshops, this two-day seminar examines the human relations conflicts that commonly affect large scale computer centers, and presents strategies and techniques for resolving them

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Jack Stone, PhD, is the Seminar Leader

Jack Stone, PhD, is managing director of Computer Education International, Inc., and is recognized in many countries for his abilities as an author, educator, and consultant to EDP managers. A Phi Beta Kappa graduate from Princeton University, Dr. Stone has been involved with computers and electronic systems for over 23 years, including eight years as an IBM Instructional Systems Manager and 7 years as a principal in several independent firms supplying management consulting and training services to large computer centers. He is a member of ACM, DPMA, AMA, and the American Society for Training and Development. Dr. Stone has contributed many articles and columns to *Computerworld* on the subject of EDP human relations, and presented a paper at NCC '76 on "ADP Training Systems." He is currently preparing his first book for publication, which deals with human relations in large-scale computer centers, and these works will form the basis for the extensive materials you'll receive in the course.

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Bits & Pieces

Datapoint Adds Printers To Dispersed Systems Line

SAN ANTONIO, Tex. – Two 132 column line printers have been added to the list of printers for use on Datapoint Corp.'s dispersed business processing systems.

The two printers impact-print upper and lower case text at speeds up to 240 line/min. Their speed is dependent on the number of printable characters per line, the firm said.

The Model 9212 prints 120- to 240 line/min and the Model 9214 prints 230- to 240 line/min. Either printer may be ordered with an option, 9213, that restricts the printer to upper case text only. Use of this option extends the maximum speed of both printers to 340 line/min, according to Datapoint.

Both models are designed for office environments, and they are said to interface directly to any Datapoint processor: the 1100 cassette, 1100, 2200 or 5500 diskette models.

The 9212 printer can be purchased for $8640 or leased for $312/mo, including metro-area maintenance on a two-year lease. The 9214 printer has a purchase price of $11,880 and a lease price of $395/mo, including maintenance on a two-year lease.

Datapoint is located at 9725 Datapoint Drive, San Antonio, Tex. 78284.

Broomall Adds Page-Size Plotters

BROOMALL, Pa. – Three page-size plotters have been introduced by Broomall Computer Graphics as additions to its general line.

Called the Series 600, these plotters are small and oriented toward use by business management, according to Broomall.

Featured is the Model 600-502, which the vendor claims is of special interest to timesharing houses and service bureaus. This device provides a means of converting data into bar charts, trend-indicating graphs, pie charts, demand calendars and other graphic forms.

Usable either on-line or as a remote peripheral, Model 600-502 also functions as an intelligent controller for keyboard/printers, the firm said.

The other two Series 600 models are: Model 600-500, with parallel input, incremental drive, and a parallel plotter interface for on-line use; and Model 600-501, with serial input, incremental drive, and an RS-232 serial interface, also for on-line use at up to 4,800 bit/sec.

Plotter prices start at $2,600. The devices are available from Broomall at 700 Abbott Drive, Broomall, Pa. 19008.

On-Line Switched Off

Tex. Bank Cuts Data Entry Personnel 45%

By Edith Holmes
Of the CW Staff

DALLAS – Texas Bank and Trust needs 45% fewer data entry people in its BankAmericard operation today than it did less than a year ago.

There are now 15 data entry operators working one shift where there were once 27 spread over two shifts, according to Juanita Beasley, vice-president in charge of this bank application, which involves processing 800,000 sales drafts and 140,000 payments each month.

Beasley attributes this reduction in staffing to improvements in system response time, overall keystroke requirements and system downtime – all achieved since Texas Bank and Trust went from conducting its data entry operations on-line to an IBM 360/50 to an Entrex, Inc. key-to-disk system.

The Entrex System 480 with two 2.4M byte disks, 15 Data/Scope keystations and a Model 510 serial printer has permitted a 23% reduction in the number of keystrokes needed to enter data, she said.

Response time has improved from "horrendous" to no waiting, since the system holds in a buffer all data that cannot be written onto disk immediately, Beasley explained. Further, the system went down only once since its installation in Nov. 1975 and that was shortly after "I wouldn't let Entrex do preventive maintenance," Beasley said.

Previous System

From November 1974 to November 1975, Texas Bank and Trust processed its BankAmericard work along with several other applications on-line to the IBM mainframe and found response time was very slow. Several hours each week often ended up in downtime, the loss of data and the need to rekey it as well, the vice-president stated.

The bank considered several systems, including IBM's floppy disk system and a 3700 series product that wasn't yet ready for delivery, but rejected them on the basis of cost, she said. Another system that seemed just as good as Entrex was also rejected because the firm had no service office in Dallas and that was of prime importance to the bank.

Entrex met all of the bank's criteria, so the system was installed.

The 480 has proved particularly attractive because of its operation simplicity, low-cost operation and dependability, Beasley said.

An easy, fill-in-the-blanks method of data entry, for example, has decreased the need for some operator training. Further, "Entrex data entry creates a better rhythm in the data entry department since there is constant keying and no waiting for system response," Beasley said. "Our operators are both pleased and more productive with the new equipment."

Texas Bank and Trust data entry operators may also be more productive in part because the system has an "operator statistics" feature which permits a review of operator performance and productivity by storing on disk keystroke rates broken down by job or by individual operator.

"At the beginning of Entrex implementation, our employee turnover increased because for the first time we had an accurate record of operator productivity and were able to separate the most productive operators from the low performers," Beasley explained. Since that initial time, however, turnover has "decreased remarkably," she noted.

Ease of Implementation

Another feature that made Entrex more attractive to the bank than the data entry systems of its competitors was its ease of implementation. The system was installed and running in one morning and training began immediately, according to Beasley.

Once learned, the checks and edit capabilities of the Extrex system speeded data flow by decreasing keystrokes, she said.

For instance, all BankAmericard payments processed contain account numbers with the first four digits in common. Exercising the Entrex Auto Dup feature, these four digits need not be keyed; they are automatically duplicated as each record appears, thus saving four keystrokes for each account number, Beasley explained.

With the previous data entry equipment, 24 keystrokes were required for sales drafts, while only 21 are needed on the Entrex system. Similarly, on payment inputs the 20 keystrokes originally required have been reduced to 13, she stated.

The BankAmericard operation also benefits from the standard job linkage feature in its data entry system. With this feature, an operator is able to continue keying from record to record without pause because all record formats were programmed to be linked in the most efficient sequence for the job, thus eliminating manual record format selection, Beasley said.

First Commercial IBM 3850 User Expects to Save $300,000/Year

WETHERSFIELD, Conn. – Users at the Conn. and western Mass. utility company here expect to save $300,000 annually with a mass storage system (MSS), according to David Laidlaw, director of systems and DP.

By year-end an IBM 3850 will enable Northeast Utilities to eliminate 19 of its 35 tape drives, three of its five tape control units and nearly 1,500 tape reels, Al Schmitz, manager of information systems development, said.

The system stores data in 706 2-in. by 4-in. data cartridges that fit into honeycomb compartments lining both walls of the 15-ft unit. When data is called for, the 3850 automatically transfers it from a cartridge to a disk drive in 15 seconds, he said.

"It has stirred significant interest because ours is the first commercial installation," Schmitz noted.

As an MSS, the 3850 has a character capacity of 35.3 billion bytes – the equivalent of storing the mailing addresses of at least 315 million people, Laidlaw said.

Northeast's growing DP operations, Schmitz explained, would have necessitated the installation of extra storage devices, such as traditional disk and tape equipment, to store twice as much information as they currently handle for new applications.

Even with the added traditional equipment, the DP system would have been overloaded, Schmitz added. So, "we decided upon an MSS."

"We knew IBM had an MSS and we investigated it. We received other announcements about one from [Computer Data Corp.] later, but CDC couldn't meet the same time schedule. IBM met the Jan. 1 delivery date," Schmitz said.

Cost Avoidance Viewed

"We haven't viewed the system in terms of savings as much as in terms of cost avoidance. Cost avoidance has reached $260,000 as of mid-May," Laidlaw said.

The 3850 provides faster and easier access to information because data flow and storage is handled automatically. "As a result we have been able to reduce our computer operations staff from 32 to 24 people," Laidlaw added.

The elimination of tape storage equipment has also freed space in the computer room for the installation of an IBM 370/168, Schmitz said. "The 168 along with a 158 will provide more processor power than we had with our three previous 158s."

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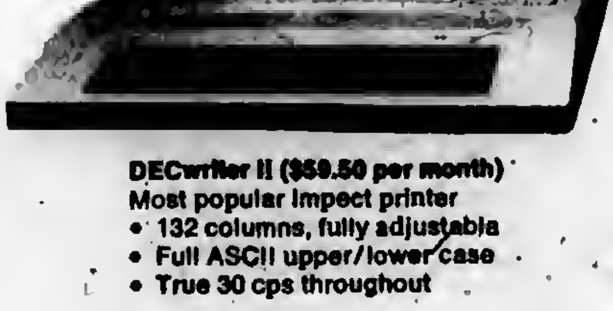

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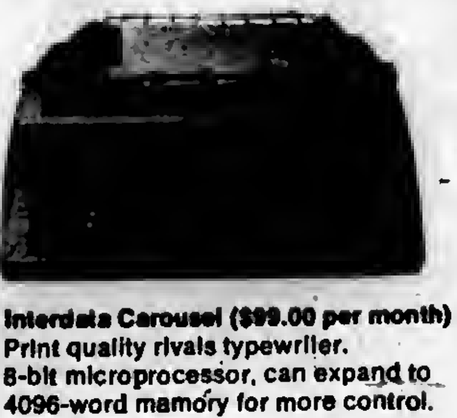

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Reliability Seen Key to TWA Reservations System

NEW YORK – On a typical day, the telephones in Trans World Airlines (TWA) reservation offices around the country will ring more than 100,000 times with calls from passengers and travel agents. Another 50,000 people will contact TWA personnel at airports and city ticket offices for assistance with ticketing and check-in.

In serving these customers, TWA employees will communicate with the company's computer reservation system nearly two million times a day.

TWA is using a version of IBM's Programmed Airlines Reservation System (Pars), running on an IBM 370/168 installed in mid-February 1975. Another 168 serves for backup and batch processing. The system supports almost 3,000 terminals in the U.S. and Europe.

'Particularly Critical'

"The reservations area is particularly critical regarding uptime," said Edward J. Gehrlein, TWA's staff vice-president for reservations DP. "The customer expects professional service – not 'we'll call you back.' Also, flight delays could result from any significant outage in check-in, seat selection, and ticket printing, for example, which we have automated at 13 major airports in the U.S. that account for more than half our revenue passengers."

"It's hard to put a dollar value on system reliability," Gehrlein said, "but we know that it's an essential part of what makes TWA the on-time airline."

TWA's figures show that during 1975 overall uptime was 98.45%, and uptime performance against schedule was 99.8%. Looked at another way, last year the system was scheduled to be operational 23 hours and 40 minutes a day. (The few minutes of scheduled downtime are used for physical reconfiguration of the system – to add new devices or to remove devices for preventive maintenance.)

The system was actually operational 23 hours and 38 minutes a day. And there were 231 days in 1975 when there was no unscheduled downtime.

This year, TWA has scheduled the system to be operational 23 hours and 42 minutes a day, with actual operation expected to be about 23 hours and 40 minutes a day. Also, the system's availability objective is to have no more than one minute total downtime per day during the peak hours of 6 a.m. to 10 p.m. Eastern Time. But Gehrlein expects to top all of these figures.

"We must also obtain system performance in a dynamically changing world," he explained. "For instance, we have about twice as many application programs today as we had four years ago and we will have three times as many by the end of 1976. The first phase of TWA's new cargo system alone is more than 50% as large as our original Pars system and when we get the entire cargo system on by the end of 1977, it will be almost as large as the original Pars."

Reservation Applications

The reservation applications include credit authorization; passenger booking; fare quotation; automatic ticketing, seat selection and boarding pass printing; seat inventory records; wait-list processing; flagging when the need for an extra section arises, and so forth.

Besides the first phases of cargo tracking and accounting, other non-reservation applications on the same system include load planning and control, hotel and tour reservations and all aspects of flight control and information except for flight planning itself which is performed in the other TWA data center.

"We are in an environment of constant additions, modifications and changes. Last year alone, we loaded 2,800 new or modified programs," Gehrlein said. "In each of the past three or four years, we have had the equivalent of 100% turnover of our application programs and still we've managed to have ever-increasing system uptime."

TWA has found that it is logical and cost-effective to piggy-back certain related non-reservations applications on the same hardware as its reservations system. "It makes better use of the central processor, the nearly 3,000 terminals linked to the system and related information already in storage," Gehrlein said. To illustrate, TWA can use the same flight schedule information to answer inquiries from passengers, cargo customers and internal maintenance and crew planning group.

"Our programmers have good knowledge of the system capabilities," Gehrlein said, "and they can apply this knowledge to other applications for our 168s. They can utilize data and programs from existing data bases and subsystems and don't have to reinvent the wheel as many times.

"In short, this approach uses capital most effectively, uses people most effectively and gives TWA maximum 'bang for the computing buck,'" Gehrlein said.

'First Domestic User'

"TWA invested 11 man-years in the conversion to the 168s and IBM put in a significant amount of effort too," said Gehrlein. "Not only were we the first domestic user of the 370 in a reservation environment, we were also the first domestic user of the control program, Airline Control Program (ACP) Model 8, and we were naturally concerned about the impact on reliability." TWA converted from 360/75 with a Model 65 as backup.

"To maintain system reliability in a constantly changing environment, you need good personnel, good hardware and good field engineers maintaining it," Gehrlein said. "One factor: the 168 is a computer designed to run more reliably than any other we've seen and it's also designed to be repaired quickly when it does fail. During the fourth quarter of 1975, the composite for the two 168s was 1.6 outages per 1,000 hours.

"And each outage took an average of 40 minutes to repair. The reservation system was not down for this long, of course. We can push two buttons on a bulk switch console and change over to our backup system in about a minute and a half. Nor were the two 168s ever down at the same time," he added.

In addition to providing backup for the online applications, the reservations DP center's second 370/168 is used for batch production work, ACP and OS/VS system testing and application testing. This system operates under IBM's VM/370 control program. Typically, two separate ACP test systems and a multi-partition OS/VS2 system will be operating concurrentlv on the 168.

"The [ACP] is a unique and excellent control system," Gehrlein said. "It's designed to run in a several-hundred to several-thousand terminal environment and is designed to minimize the effect of failures – to keep the system running if at all possible and to purge the effect of failures as quickly as possible."

Total staff at the reservations DP center is 175. Of these, 69 are in operations, 25 in systems programming, 10 in communications and network design, 65 in application programming and the remainder in management.

The airline operates a second data center – the Commercial DP center – with many of the same objectives of efficiency and high-system availability. This center, which provides DP for airline users in marketing, finance, maintenance and planning, utilizes a third 168 and a 165 II with OS/VS and IMS/VS.

The two machines are controlled as a single entity through the Attached Support Processor (ASP) capability of OS/VS, providing cost-effective use of processing power, I/O equipment and operations personnel.

"We are all familiar with the term 'economy of scale,'" Gehrlein said, "and we know we are achieving that at TWA. But, we are also achieving 'reliability of scale.' Together, these add up to more efficient use of DP and maximum uptime of the applications for which reliability is most critical."

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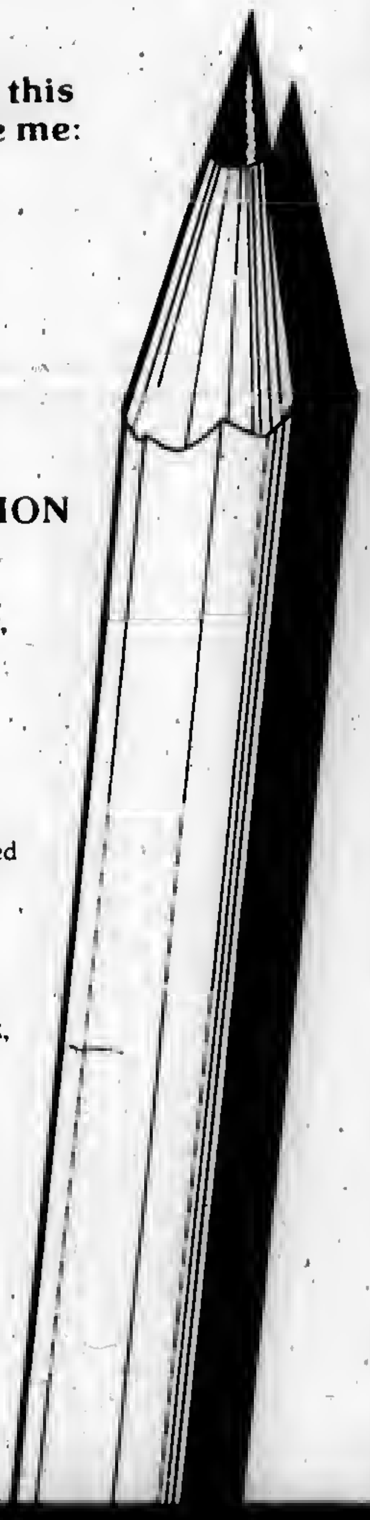

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Using Integrated Storage Control

Independent Disks Save City $127,000 in Nine Months

SAN FRANCISCO – An estimated $127,000 has been saved by the central DP facility of the City and County of San Francisco during nine months of fiscal 1976 by installing Memorex Corp. equipment in place of the original disk system supplied by IBM.

The new equipment, providing a capacity of more than 14 billion bytes of on-line storage, includes 17 Memorex 3675 (200 Mbyte/spindle) disk drives and two 3670 (100 Mbyte/spindle) drives.

The dual-spindle drives are arranged in five strings, each controlled by a Memorex 3673 disk controller which allows the direct attachment of the drives to San Francisco's two IBM 370/158s.

One computer is dedicated to teleprocessing, and operates 24 hours a day on-line with 300 terminals located throughout the city.

This system is largely responsible for handling Cable, a law enforcement information network utilized by the police and others in the criminal justice system.

The system maintains records of persons, vehicles, premises, incidents, cases, locations, personnel, resource allocation, management information and records management.

The Cable system also interfaces, through a communications processor, with local, state and federal data bases to aid in the apprehension of criminals.

On-Line and Batch Processing

The second 370/158 computer handles Faster, a system serving a myriad of city departments such as hospitals, social services, traffic, tax collections, budget, accounting and assessments. There are about 200 terminals in the Faster system, accessing 13 Memorex 3675 drives, for on-line and batch processing activities.

The tax collector's office maintains property tax records using Faster, while the city assessor uses it to update files. The Department of Social Services has 37 terminals in five buildings which access information on about 400,000 cases stored in the system. In addition, updated voter lists, civil service sick pay and vacation records are stored.

Batch processing activities performed by the City and County of San Francisco on its Faster system include payrolls, food stamp authorizations, and library, budget and traffic citation records as well as a host of miscellaneous statistics and calculations.

In selecting the Memorex equipment to replace the previously installed IBM disk system, several factors were taken into account according to Ralph Mayes, chief of systems at the DP facility.

Compatibility Crucial

"Our first criterion was compatibility with the two mainframe 370/158 computers," Mayes said. "We didn't want to add another box to interface the 158's which have Integrated Storage Control (ISC). Memorex's 3673 disc controller allowed direct attachment of the 3670/3675 drives to the 370/158 ISC.

"We were also seeking maximum value for our DP expenditures," Mayes added. "Equipment reliability has been very good and response to maintenance calls rapid," he said.

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Take advantage of this excellent opportunity to keep abreast of product developments and trends in the fast-moving world of data communications.

Sign up for Data Communications UPDATE/EAST sponsored by *DataComm User* magazine October 6 and 7 at The Plaza in New York. Space is limited. Use the handy form below to make your reservation now.

The Program

OCT. 6 – A.M.: NETWORK PROCESSORS

Popular mainframes and how they stack up for datacomm applications, with a look at how mainframe manufacturers are upgrading their machines' teleprocessing capabilities.

Datacomm software. How the trend to distributed DP and on-line data base systems is affecting data communications software offerings, and what changes users can expect with SNA-type networks.

Communications processors. Users detail their evaluation procedures for selecting communications processors for front-end and message switching applications.

Plus – a rundown on IBM's enhancements to its 3704/5 and the improvements they triggered in competitive front-end processors, as well as the state-of-the-art with the less-volatile message switchers and data concentrators. Also a review of processors and their role in centralized and distributed networks, with an update on networking techniques and protocols

P.M.: TERMINALS

Terminal evaluation. Users give their individual formulas for appraising on-line interactive devices and data entry/processing terminal systems.

Teleprinters and glass Teletypes. A status report on the latest impact and non-impact machines and their CRT equivalents.

Microprocessors and semiconductor memories How they are improving IBM 3270-compatible terminals.

Multifunction terminals. An examination of the trend to combine the traditional functions of data entry and remote batch terminals.

Latest vendor moves in intelligent terminals, and how users can best make the intelligence pay

OCT. 7
A.M.: DATA TRANSMISSION SERVICES

Carriers. Leading users explain their rationale for selecting services from various carriers.

Tariffs. A study of Bell's latest tariffs, including MPL and DDS, with the latest on its switched digital offerings

Satellites. A review of the services and tariffs of specialized and satellite carriers

Value-added carriers. A tutorial on packet-switched services with a rundown on tariffs and carrier plans

International services. A look at how they stack up for data communications in light of recent moves by the FCC and the international record carriers.

P.M.: MODEMS AND MULTIPLEXERS

Evaluations. Users assess modems and multiplexers and trace their trade-offs in making evaluations

Latest developments with high-speed modems and the trend to intelligent multiplexers.

Post-DAA view of medium- and low-speed modems and the changes users can expect with digital transmission services.

Network diagnostics. Users outline their equipment selection and network management procedures for ensuring minimum system downtime.

Test gear. How portable, easy-to-use devices can help users become better network managers.

Tech control centers and other tools for diagnosing and correcting problems in centralized and distributed networks.

Your UPDATE/EAST Registration Form

Dr William A Saxton, Chairman
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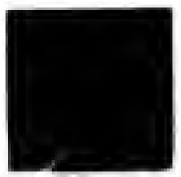
Speakers announced for UPDATE program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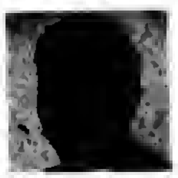
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Leading datacomm users, consultants, and vendors are scheduled to address attendees at Data Communications UPDATE, sponsored by *DataComm User* magazine, October 6 and 7, 1976 at The Plaza in New York City.

Speakers and subjects to be covered include:

CPU's: Elizabeth F. Severino, Managing Editor, Auerbach Information Management Series. **Datacomm Software:** Ernest E. Keet, President, turnkey systems inc. **Communications Processors:** Gilbert Held, Acting Chief, Teleprocessing, U.S. Civil Service Commission, Clarence G. Marshall, Director of Advanced System Development for Communications Switching, Collins Radio Group/Rockwell International; Richard A. Loveland, Product Manager, Networks and Communications, Digital Equipment Corp.

Terminals: George B. Bernstein, Jr., Operations Research Analyst, U.S. Naval Supply Systems Command; Daniel M. Printz, Marketing Planning Manager, Teletype Corp., Gerald W. Fleming, Manager, Applications and Development, Data 100 Corp.; Les E. Staples, Product Manager, Data Communications, Datapoint Corp., Loren Parsons, Product Manager, Applied Digital Data Systems.

Transmission Services: Stan M. Stanley, Administrator, Telecommunications, American Can Co.; Minor S. Huffman, Jr., Executive Vice President, Center for Communications Management, Inc.; Wayne A. Robins, Marketing Director, Data Services, AT&T; Ned Farinholt, Director of Market Services, Data Transmission Co.; Serge Wernikoff, Vice President, Planning, Western Union International, Dick Anderson, Regional Manager, Telenet Communications Corp.

Modems: Robert J. Kaufman, Operation Systems Project Manager, Damon Corp.; Farrel Peltz, Vice President, Regulatory Planning, Codex Corp.; George R. Grumbles, Vice President, Marketing, Universal Data Systems. **Diagnostics:** Paul R. DeVane, Assistant Manager, Communications Planning and Engineering, Manufacturers Hanover Trust, J. Lightsey Wallace, Assistant Director in Charge of Product Planning and New Product Development, Atlantic Research Corp., James E. Palmer, President, Spectron Corp.

Dr. William A. Saxton, publisher of *DataComm User* and UPDATE chairman, states that the 2-day briefing "provides an excellent opportunity to catch up on the latest developments in data communications products and services." He also urges datacomm interests to register promptly since space is limited. *(Note: See accompanying advertisement for more details and registration form.)*

Mini Processes Book Data

Publication Keeps Track of Auto Price Fluctuations

By Esther Surden
Of the CW Staff

GAINESVILLE, Ga. – A minicomputer has enabled a publishing company to increase control over the data involved in the production of its weekly on automobile holding prices, according to Howard Gardner, vice-president of the company.

Prior to installation of the minicomputer, National Auto Research Publications, Inc. here had been processing the data for *Black Book* by hand. The end resulting prices were batched to a mainframe at the firm's parent company, Cox Broadcasting Corp. in Atlanta, he said..

The company was not satisfied with the arrangement because, as Gardner noted, "We are a weekly and speed is of the essence with us." So it investigated the various alternatives available.

With a minicomputer, National Auto felt it would be in control of production and able to receive its data in a timely manner. A requirement for the system was that a DP professional not be necessary in-house.

Selecting a System

Gardner looked at most of the major minicomputer manufacturers in selecting a system. He had all but decided to stay with batching the data when, with some technical advice from Cox, he found a Micos system from Minicomputer Systems in Elmsford, N.Y.

Through Kreinest, Scott and Associates, Inc., the firm contracted for both the hardware and the software so the maintenance responsibility would lie in one place, Gardner said.

The Micos system includes a Data General Corp. Nova 2 with 64K of memory, 20M bytes of disk storage, four CRTs, a 600 line/min printer, a combination mark sense and punch card reader and a paper tape punch.

The paper tape is fed into a Compugraphics Computage II phototypesetter which reads the tape and sets the type, he added.

The hardware/software configuration represents about an $85,000 investment.

Information for the book is captured on the mark sense cards by employees who attend automobile wholesale dealers auctions throughout the country as each car is being sold, and record car condition, equipment, features, etc., as each car is being sold, Gardner explained.

The card is then returned to headquarters, where it is run through the card reader. The system captures and edits the data and adjusts the price so that each car comes out with a comparable price.

This is important, Gardner noted, because the prices represent comparisons between cars equipped with such things as power steering, power breaks, air conditioning and automatic transmission. Occasionally a car with a stick-shift transmission or one without air conditioning will be sold.

A printout of the results is then made. At this point the automated process is interrupted, he added, to allow editors to "determine what shifts have happened in the market during the last week."

The editors sit at the CRTs, which have the format of the book displayed on them. Reviewing the old prices and all the new prices that came in that week, they determine the prices for the book.

The "human factor" is necessary, Gardner said, because subjective decisions go into the price determinations.

The new prices are entered and resulting information is then recorded on the printer. The company hopes to eventually transmit the results directly to the typesetter.

Other applications include the maintaining of mailing lists of subscribers and the printing of mailing cards, instead of labels, for the books.

System Displays Kids' Medical Histories

Special to Computerworld

BOSTON, Mass. – Medical records on about 8,500 young people are now available to doctors treating them at either of two neighborhood locations here through the use of a disk-based minicomputer system.

The medical person on duty at the Boston City Hospital (BCH) walk-in clinic and the Harvard Street Neighborhood Center (NHC) can call up via CRTs a summary of each child's active, inactive and resolved illnesses, chronic problems, allergies and medications presently in use. The summary also notes when the child was last seen, where and by whom.

The Medical Records Communication (Marco) system was developed by Dr. Joel Alpert, chairman of the Pediatrics Department of Boston University School of Medicine and pediatrician-in-chief at Boston City Hospital; Harold M. Goldstein, professor and director of the Northeastern University Department of Economics, Center for Medical Manpower Studies; and Wendy Mela, a systems analyst at the center. The project was funded with a grant from the Bureau of Health Manpower of the U.S. Department of Health, Education and Welfare.

Based on DEC PDP-11/45

Marco is based on a Digital Equipment Corp. PDP-11/45 minicomputer which runs on a Mumps operating system. The processor has 28K of core memory with two disk drives providing 160 million characters of additional file storage. The medical record information is accessed by two CRTs at each location, with printout capability supplied by LA36 Decwriter-IIs – one at each location. In addition to the Decwriter, a high-speed printer at the hospital provides complete printouts of the medical records.

"BCH is heavily invested in the network of Boston's 10 neighborhood health centers," Alpert said.

"For people in the inner city, the transfer of medical information becomes an extremely important part of good health care. In making it possible for us to exchange information between the neighborhood health center and the back-up hospital, Marco has made it possible for us to improve delivery of health care," Alpert added.

Even if a youngster had previous treatment at the hospital, until now, no attempt would be made to obtain the past record unless special circumstances were indicated. The reasons are logistical and economic.

At BCH, patient records are kept in the administration building some distance from the walk-in clinic with limited manpower to retrieve them. The child could be treated and on the way home in the time it would take to cover the ground between buildings.

With Marco, the child's name or hospital number, when keyed into the system, causes a summary of the child's health status to be printed on a nearby terminal. This will usually tell the doctor treating the child all he has to know, including whether the medical record should be retrieved.

When a child is treated at the neighborhood health center, medical records are available. The computer summary, however, provides complete information for all active problems and its use saves time that would be spent securing and reading the handwritten record. Since about 85 children a day are seen in the neighborhood center and about 100 a day in the walk-in clinic, time is important.

One fringe benefit of computer systems like Marco, according to Goldstein, is the education that medical interns and residents will receive in keeping good records. This, in turn, will make it easier for supervisors to review their work and pick up errors.

"More important, Alpert added, it has shown them some of their own inconsistencies. Even a simple diagnosis can be written several ways. Marco forces us into a standardized way of speaking which, though it runs the risk of losing individuality, has the advantage of communicating in a more consistent and logical way."

The nature of the environment at BCH and its 10 affiliated neighborhood health care centers differs from that of the traditional pediatrician's practice. In the hospital center environment, a child may

(Continued on Page 29)

Warrex Centurion I-A Features Diskettes, Concurrent Tasks

DALLAS, Texas – The Centurion I-A from Warrex Computer Corp. is a disk-based small business system that allows three programs to be run concurrently, the firm noted.

A diskette version of the firm's Centurion IV cartridge disk-based system, the I–A can be configured with a minimum of 24K bytes of MOS memory expandable to 60K bytes.

The Centurion I-A basic hardware configuration includes the CPU and memory, a 1920-character CRT, two diskette drives and a 175 char./sec matrix printer. The system can be expanded to accommodate up to three CRTs, four drives and a 300 line/min chaintrain-type printer, it added.

The diskette drives can be IBM-compatible, allowing the system to be used to receive data entered via an IBM data entry device, Warrex said.

Software packages available for the system include accounts payable, accounts receivable, random general ledger, amortization, professional billing, oil royalty, depreciation, general ledger, a medical package, hospital package and sequential payroll package. The operating system is a real-time disk system.

The Centurion I-A will be available the first quarter of 1977, costs about $20,000 for the basic configuration, according to Warrex.

The company is located at 12505 N. Central Expressway, Dallas, Tex. 75243.

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County, U.S. Initiate Training Program

PATERSON, N.J. – When a county and the federal government put their heads and assets together, they came up with some jobs for the unemployed and a minicomputer for the county.

Initially, under the Comprehensive Employment and Training Act (Ceta) which provided the funds, 10 residents of Passaic County here were trained and employed by the county as computer programmers and operators. An eleventh person was placed in industry. Another training session has already begun.

The county's minicomputer is an NCR 399 leased for the program because the county had another NCR and wished to train its residents to operate and program it. Other minicomputer companies were contacted, according to County Administrator Harold Leib, but none could offer the support NCR did, he noted.

The county had been heavily committed to outside DP services and was looking for an alternative at the same time this program to help the disadvantaged was available, Leib noted.

It seemed like the perfect combination, he added.

Prior to being certified by the state employment service, trainees must meet eligibility requirements and pass a programming aptitude test. Besides programming courses, the trainees take courses on general subjects.

After the computer was installed, NCR systems analysts spent two days a week for two months supervising hands-on training for the group and implementing the county's business applications.

The business applications include purchasing, personnel and an inventory of positions available. The county is working on a voter registration program which is being debugged on the 399, Leib said.

The program is now being carried out in conjunction with the Passaic County Community College and the county is now footing the bill for the lease of the NCR equipment, he noted.

The minicomputer features a console that can handle magnetic ledger cards, a punched card reader, printer and magnetic disk unit. A CRT is attached to a cassette unit which the trainees use to record their programs. It costs about $2,500/month, he noted.

The system has worked well for the county, Leib said, and the program is working well for the trainees. One of the trainees just recently left the county for a high-paying job in industry, he noted. Although the county hated to lose her, it is glad to know the program is successful, he added.

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PRINCIPAL/LINE INQUIRIES WELCOME

System Gathers Medical Records

(Continued from Page 28)

be treated by multiple providers (doctors, nurse practitioners, etc.) at multiple facilities. According to Mela, this method of care presents severe communications problems.

"A study of the communications link between BCH and one neighborhood center revealed that only 10% of all hospital encounters were legibly recorded in the NHC record," she said.

In time, the capacity of the system will have to increase, Melo noted, "We underestimated the amount of space that would be required for each child. This happened because we took our estimates from existing records. Now, we find providers are writing more."

Each time a child is seen, the medical provider fills out a General Pediatric Encounter Data Sheet, which has a check list of major problems, space for free text on subjective and objective history, vital signs, laboratory tests, medications, etc.

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Circulation Control Aim of University's Minicomputer

BLACKSBURG, Va. – A minicomputer-based book circulation control system at Virginia Polytechnic Institute (VPI) and State University's (SU) library takes patrons through the check-out process quickly while providing the library with a record of each item in circulation, the user said.

With the library growing at 100,000 volumes per year, VPI and SU installed the HP 3000 mini to automate its check-out and check-in procedures and to provide greater control over circulating items.

The system can also perform search, hold and recall functions and can provide the user with information on each volume's status and circulation restrictions.

VPI and SU, which has 18,500 undergraduate and graduate atudents and 6,000 staff and faculty members, claims to be Virginia's largest university.

The most immediate and obvioua benefit to the library patron from the computerized system is the more convenient check-out procedures, according to Dr. Vinod Chachra, director of systems development.

Under the manual system, the student or faculty member filled out a card containing each volume's call number, title, author, the patron's name, address and phone number and presented the book, the check-out card and the patron's identification card to the circulation clerk who stamped the book and entered the check-out card into the circulation file.

Transaction Time

Each transaction took approximately three to five minutes per book. There was no means of determining whether there were any restrictions on the patron because of outstanding library fines or overdue books or if any restrictions were placed on the book's circulation period.

With the new system, the patron presents the book to be checked out to a circulation clerk along with an identification card. Each book has a bar code on it containing the item number which relates the book to its bibliographic data, including the book's circulation period. The patron's identification card has a similar bar code on it containing his identification number. The clerk scans each bar code with a light pen device which relays the coded information to the mini.

The system records the book as being checked out to the patron and relays the volume's circulation period back to the circulation desk where it appears on a CRT terminal. Circulation periods vary according to the book and the patron's classification (student or faculty).

The clerk then issuea a hand-stamped due date slip to the patron along with his book and identification card and the transaction is completed.

The system overrides completion of the transaction in the event there is a hold or recall tag on the book.

There is also a data base on each patron. If the system shows that the patron has outstanding books or unpaid library fines, these matters must be cleared up before he is allowed to check out the books.

Book Backlog Eliminated

When a book is returned, the clerk once again scana the bar code with the light pen device and informs the system of the book's return, clearing the record associating the book with its previous user. The system informs the clerk on the CRT whether there is a hold or recall tag on the book.

According to Randal Crockett, project manager for the system, the manual check-in procedure sometimes produced a large backlog of unprocessed books, delaying the delivery of notices to patrons informing them that books on hold or recall were available.

"The clerk had to go to the circulation file and pull each check-out card," Crockett said. Circulation files had to be searched manually to determine what items were in circulation or overdue.

Now an operator merely enters a request for overdue books at a keyboard and the computer issues overdue notices at a 200-line/min. printer. Recall requests are also entered into the computer at periodic intervals. Recall notices are issued from the printer informing a book's current user that someone else needs the book and that it should be returned as soon as possible.

The bibliographic search aspect of the HP 3000 system utilizes the same data bases as the circulation control portion of the system.

The amount of information which appears on the CRT terminal about a book increases as more specific data is entered at the keyboard. If, for example, a patron knows only the book's author, that is entered and the computer relays back all the titles by that particular author along with the call numbers.

Then the operator may choose one call number and the computer will relay back to the CRT terminal a list of books with each volume's item number and the status of each item. If then an item number is chosen, the CRT terminal will show an individual volume's publisher, publication date, price, a brief bibliographic description, who has checked the book out, the due date and any holds or recalls on the book.

To find a book this way, the patron has to know something about the book he wants. The system does not provide for a search by subject matter. The VPI and SU library administration opted not to provide that feature because subject classifications are frequentiy changing and they did not believe it would be worthwhile to put in a subject classification search system.

VPI and SU officials decided to install the HP 3000 to computerize the library's circulation system because it was less expensive than upgrading the central computer to handle the 125,000 transactions per month generated by the circulation control system, Chachra said.

In selecting a stand-alone computer system, VPI and SU sought a system which would provide a response time of two seconds or better 95% of the time for check-in and check-out transactions; a response time of better than three seconds 75% of the time; and a response time better than five seconds 95% of the time for data entry into the system to create the initial computer record on each patron or item, he noted.

VPI and SU's HP 3000 computer has 128K bytes of memory, and two 47 Mbyte disks providing sufficient storage for the library's present needs and for future expansion.

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Read our special report on *Supplies and Security* in the September 27th *Computerworld*.

Harry S. Truman, in his oft-quoted phrase on our improvident ways, admonished us to "Use it up, wear it out, make it do, or do without." As much as it made sense to the sugar-saving housewives of 1946, that wartime motto is excellent advice for the computer rooms of today. Our September 27th supplement, titled *Supplies and Security*, takes that advice, and we'll show you some innovative ways to save money by conserving supplies.

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Necessary Software Available

Minis Viable Alternatives for Colleges

By James Farmer

Special to Computerworld

For many years minicomputers have performed specialized functions at colleges and universities. These included data collection and data reduction, principally as part of a larger experimental apparatus, interactive Basic and Fortran for limited problem solving and communications controllers.

Typically the software was designed by the user, or the manufacturer's relatively unsophisticated compilers were used.

Large general-purpose computers were expected to have at least ANS Fortran, ANS Cobol, special load-and-go compilers for students, macro assemblers and an operating system which supported sequential, indexed and direct file access.

Most academic centers also wanted Basic and/or APL for interactive student use and occasionally used Snobol and PL/1. The computer had to be large enough to support at least one of the well-documented statistical packages.

Administrators Want Cobol

Administrators wanted Cobol and sufficient core size to use the administrative software written at other institutions and typically requiring 112K to 224K bytes.

Some time-sharing access to administrative files, such as IBM's TSO or CMS, was desirable and colleges also found it useful to be able to communicate with specialized computing centers via industry-compatible IBM 2780 communications protocol.

The future availability of a widely used data base management system (DBMS) such as IBM's DL/1 or Codasyl DBMS was also desirable.

Until last year, none of the so-called "minicomputers" could provide these kinds of services. Most colleges with enrollments of less than 5,000 could not afford any of the computing services needed for the academic program and administration.

But mi[illegible]ters have recently "grown" so they have the core size and speed of small general-purpose computers and use the same peripherals.

There was, however, no manufacturer which had the software support to meet the broad requirements of universities until last year.

There are now at least four manufacturers whose machines provide Basic, Fortran and Cobol and have sufficient size to directly support available administrative applications and statistical packages.

All have operating systems which support both interactive use and time-sharing for academic and administration applications. Some support communications with other computers using the IBM 2780 protocol.

The vendors have announced APL as well as Basic and also offer indexed sequential file access methods incorporated into their Cobol compilers. This is important since much of the administrative software for colleges and universities, particularly interactive keyboard/terminal-supported systems, uses the indexed sequential access method. They also have under development Codasyl DBMS.

Prices and Support

The prices for the general-purpose minicomputers range from $3,000 to $6,000 per month for a typical college system. This includes the five-year amortization of a purchase of the hardware and operating system software and monthly maintenance. A comparable general-purpose computer would cost between $5,000 and $12,000.

Surprisingly enough, the price differences arise from the price of software and the type of support offered by the manufacturer. The major general-purpose manufacturer has a software pricing policy which is the same for either a large or small user.

Software Half the Cost

This means software licenses may be as much as 50% of the cost of a small computer system. The minicomputer software either has a one-time charge (which, amortized over five years, is significantly less than a monthly license fee) or is bundied in the hardware and maintenance costs.

Because of the decreasing costs of hardware and increasing costs of support personnel, minicomputer users can expect that some of the price differences will reflect the amount of support services which are to be provided.

The cost of software development must be divided over the available customer base, so manufacturers with volume may have a price advantage over those with less volume; the difference may also arise from different levels of support.

Compromises Affect Users

Designers of minicomputer hardware and software must make some compromises, and these compromises are more likely to impact the minicomputer user than the user of a general-purpose computer.

For example, most general-purpose computers will read physical tape records up to about 30K characters; one of the minicomputers can only read 4K characters – less than the record size of most data files exchanged among institutions and agencies.

The size of the procedure division of a Cobol program is restricted by most minicomputers and limits of 23,000 and 64,000 bytes have been identified.

Limits Program Calling

Many of the software systems for minicomputers limit the ability of one program to call another. This capability is imperative if many of the current Cobol applications are to be used.

Similarly, the precision of floating-point computations differ and it may not be possible to implement double-precision arithmetic to compensate for the reduced precision of standard floating-point arithmetic.

The implementation of interactive administrative applications may require design approaches different from those used with more sophisticated operating systems. There is a particular danger of inherent error during simultaneous on-line update of records using unsophisticated operating systems.

Three Appropriate Uses

There are three appropriate uses of minicomputers for general-purpose college and university computing. First, the mini is an excellent entry-level machine when the demand is relatively small and the institution has the discipline to assure that both academic and administrative applications are designed to be readily transported to another machine.

This means applications should be done in either Cobol or Fortran, that a limited set of language features should be used and that file formats and access methods should be used which are common to general-purpose machines.

Second, when the minicomputer is dedicated to an application which will be stable throughout the useful life of the application and a continuing investment in software will *not* be made, the minicomputer offers an excellent investment.

The application must be well defined and have a long useful life to permit the cost of the hardware and software to be fully amortized over the useful life of the applications software.

Also, the application should not require a continuing investment which would preclude a changeover to another computer system at the end of the current useful life.

Carefully Developed Plan

Third, the general-purpose minicomputer can be a cost-effective approach to general college computing when there is a carefully developed plan for development and use of the computer system and its associated applications, standards to permit later change to another type of hardware and an understanding that there will be operational limitations.

Farmer is a senior staff member at Systems Research, Inc. in Washington, D.C.

Correction

The Chicago suburb in the story "Police System Designed to Patrol Data" [CW Aug. 23] is Lake Forest, Ill.

-ANNOUNCEMENT-
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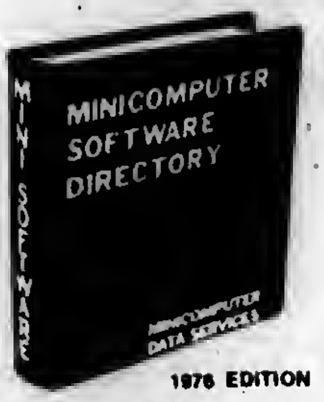

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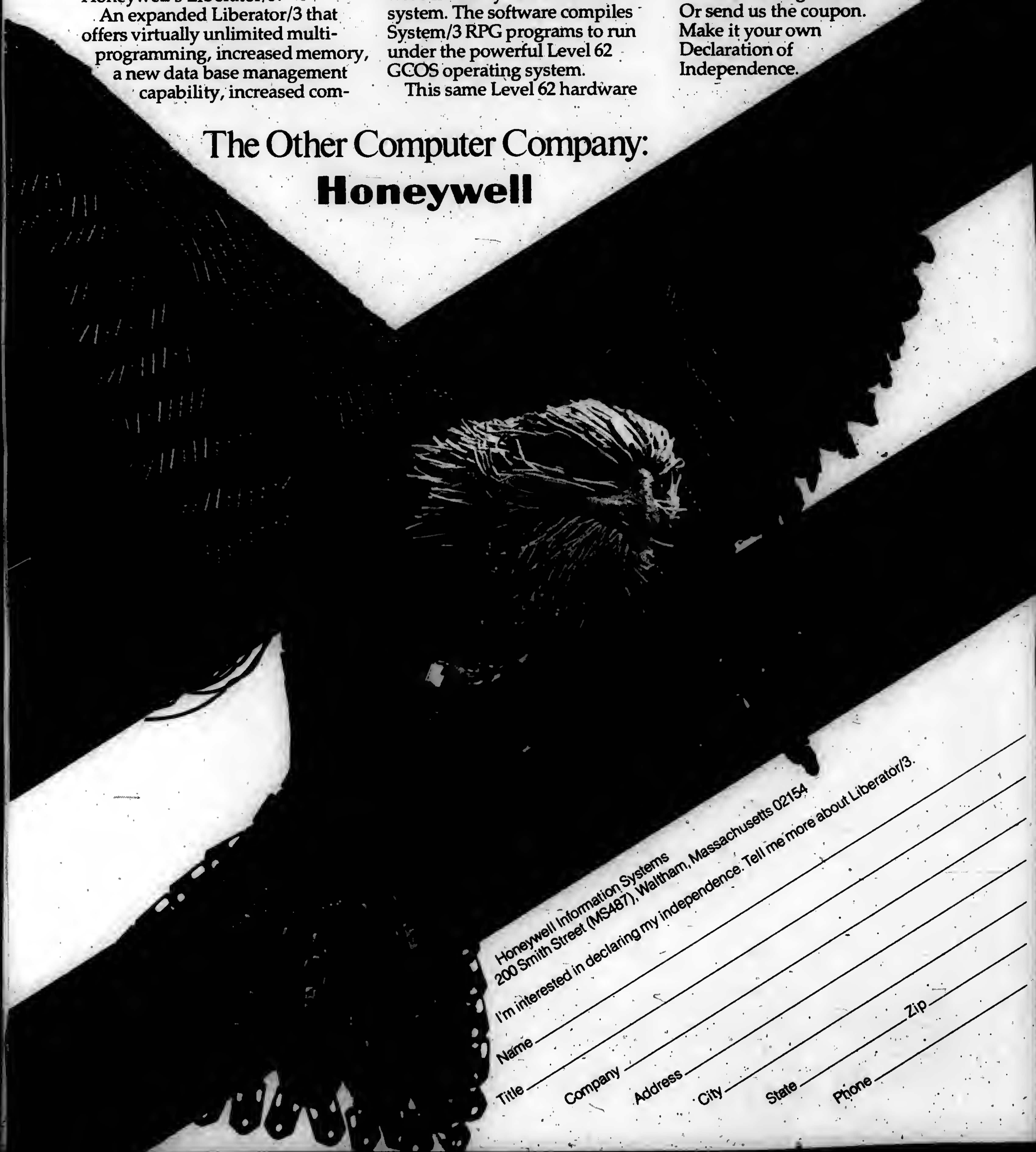

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COMPUTER INDUSTRY

Memorex Suit Asks Unbundled 3344

SAN FRANCISCO – Memorex Corp. has filed for a preliminary injunction to require IBM to price and offer separately the disk packs and drives on its 3344 and 3350.

The motion, filed in federal court here, alleges IBM is illegally tying the price of the packs and drives, which are sold as one unit.

Memorex said the issue has been added to its antitrust suit against IBM initiated in 1973. Because its suit is not scheduled to go to trial until March 1977, it seeks a speedy ruling on the motion.

An IBM spokesman said the motion relates to products announced by IBM in July 1975 and shipped since March 1976.

Memorex' claim of alleged unlawful pricing "has no merit whatsoever," he added.

CI Notes

Geological Survey Orders Three HIS Multics Systems

WASHINGTON, D.C. – The U.S. Geological Survey has ordered three Series 60/Level 68 Multics computer systems under a $15 million contract with Honeywell.

Each system will consist of dual Model 68/80 Multics CPUs. Installation is scheduled to begin in November.

AMS, Nortec Settle Suit

SUNNYVALE, Calif. – In preparation for its merger with Intersil, Inc., Advanced Memory Systems Inc. settled its two-year old litigation with Nortec Electronics Corp.

AMS has agreed to pay Nortec a total of $800,000 under the settlement, which also calls for termination of Nortec's technology license covering several AMS components, AMS said.

Settlement costs will be reflected in fourth quarter results. The Nortec suit sought $5.9 million in damages, charging breaches of purchase agreements and licenses.

AMS and Intersil directors approved a definitive agreement for the merger.

After Datran's Demise

Carriers Fear Users May Doubt Viability

By Molly Upton
Of the CW Staff

Several carriers generally agreed Data Transmission Co.'a (Datran) [CW, Aug. 30] demise will cause the more timid users to run to AT&T for safety while the braver users will closely scrutinize the viability of individual carriers.

Regarding possible effects on the specialized carrier industry, one industry spokesman pointed out the need to distinguish between Datran, which provided a digital network, and many of the other carriers which service both voice and data over analog networks.

"I wouldn't read too much into the demise of Datran because the other carriers' potential markets are larger and their base is broader," he said.

"However, Datran's demise will very seriously discourage new specialized common carriers," he added.

"It emphasizes how capital intensive Datran's business is and how aggressively AT&T will compete with other companies that are building duplicate transmission facilities," he added.

Other carriers have other, less capital intensive means of providing service, he said.

But Datran's intended exit will bring closer examination of the viability of specialized common carriers, he observed.

Rex Hollis, vice-president of marketing for Southern Pacific Communications Co. (SP), agreed, adding "All specialized common carriers will be looked at very hard, and if the telecommunications manager has concern about the solvency of the carrier, I think sales are certainly going to be more difficult in that situation."

The move brings to mind the magnitude of the task of the specialized common carrier "since we're fighting an awful lot of heavy competition. Those firms most affected will be those that are not well financed," he observed.

However, Hollis said, he hopes the move by Datran will not have a negative impact on the industry.

John Worthington, vice-president and general counsel of MCI Telecommunic-

(Continued on Page 34)

Modem Orders Surging Slightly But Overall Picture Balanced

By Toni Wiseman
Of the CW Staff

Data Transmission Co.'s (Datran) cessation of operations [CW, Aug. 30] will not mean landmark business for any of the modem manufacturers, but several have already begun shipments to users moving off the network who need their own modems.

An industry source observed Datran's demise will increase sales for the modem makers, but the increase probably will not be significant because Datran was not very large and not yet well established as a supplier of digital services.

"In other words, even if one manufacturer were to pick up all of Datran's customers [estimated at 198] it would be very nice, but it wouldn't mean much in terms of percentages to modem manufacturers who talk in terms of thousands of customers," he said.

Farrell Peltz, Codex Corp. vice-president of regulatory planning, agreed. "Even if each of the 200 customers had requirements we could deal with, that wouldn't be a big enough swing to make any big change in our activities," he said.

Codex, he said, had no contract as a Datran supplier.

The firm has launched a special effort to accommodate "users left in the lurch," he said, attempting to ship these orders on an expedited basis.

Was Large Paradyne Customer

Datran was a large Paradyne Corp. customer, accounting for 11% to 12% of its business last year, according to William Siegrist, Paradyne's product manager for modems.

"We have, with new product announcements, increased our revenue to the point where it is not dependent upon Datran because there's been a question about its viability for some time," he said.

Datran's discontinued operations will not affect Psradyne's business one way or the other, he added.

We'll generate some additional revenue from picking up some Datran customers, but we'll also lose revenue because we won't be shipping to Datran. It will probably be a wash, just about even," Siegrist said.

The laws of economics will also be at

(Continued on Page 35)

Defamation, Antitrust

Univac Sued for $27.5 Million

LOS ANGELES – In response to a downturn of its disk pack business for Univac's 8416 and 8418 drives, Arber Industries, Inc. has filed a seven-count suit against Sperry Rand Corp. claiming damages totaling $27.5 million.

The counts include four violations of antitrust laws as well as defamation and interference with present contractual and prospective business relations.

Arber is the parent corporation of Athana Inc., which manufactures disk packs for Univac as well as other manufacturers' systems.

A Sperry spokesman said, "We have not seen the papers yet and therefore cannot comment."

Arber charges that Univac, since its acquisition of Information Storage Systems, Inc. (ISS) and more recently of Caelus Memories Inc., is tying in sales of its disk packs on its 8416 and 8418 drives.

The packs for these drives comprise a "substantial portion" of Athana's business, a spokesman said.

In addition to defaming, disparaging and otherwise maligning Athana products, Univac forbade the use of such disk packs on its leased 8416 and 8418 drives and otherwise coerced purchasers of such disk drives to refrain from using the Athana packs, according to the suit.

"These activities have completely killed off sales of our compatible disk pack products. Since Sperry Rand is our only competitor for these packs, it's obvious who's been benefiting by these unfair tactics," an Arber spokesman said.

Univac has been telling its customers the

(Continued on Page 35)

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Carriers Fear Datran Demise Strengthens AT&T Grasp

(Continued from Page 33)

ations Corp. commented that Datran was not a direct competitor of MCI because it was a digital rather than analog microwave system.

"Nonetheless, MCI is obviously sorry that any member of the specialized communications industry has found it necessary to go out of business," he said.

"You've probably noticed Datran filed an antitrust action against AT&T. What it's alleging in its actions probably had a good deal to do with its being forced out of business," he said.

SP is extremely concerned with the fate of Datran and most specifically Datran's link between Kansas City and St. Louis, which it uses as part of its network.

SP has offered to lease the facility from Datran and to pay all operational costs from the day it assumes responsibility, Hollis said.

Telenet was a previous user of the Datran network, but has not used any Datran circuits since a year ago when Telenet switched to 56 kbit/sec transmission, a spokesman said.

Glenn Lake, Northeast district sales manager for Western Union (WU) said WU is not a specialized common carrier since it has business in other areas, such as telegram, mailgrams and private line systems.

"Our reaction was that [Datran's demise] was expected, and most of the circuits will go to AT&T because a lot of companies are getting afraid to go with the smaller carriers," he said.

"If AT&T continues its fight against the specialized common carriers, I'm sure" it will be harder for firms to grow in the industry, he said.

Price War

"There's a price war on now as well," he commented. "AT&T has raised its rates considerably in the low-speed market, and we've benefitted from that because we've picked up a lot of its low speed customers, such as major financial companies and many of the reservation companies because of this.

"Now we're competing directly against it in the high-speed area." AT&T lowered its rates in the high speed area and WU is in the process of filing for lower rates also, he said.

An industry spokesman said "It's a sad situation when new technology such as Datran had to offer suffered because of the intense competitive environment provided by AT&T."

Tymshare, Inc. intends to proceed with its plans to become a specialized common carrier, according to its president, Thomas J. O'Rourke. The firm has been operating its system for several years primarily for its own use, he said.

But he too distinguished between the heavy capital investment of constructing towers, such as Datran has done, and Tymshare's technique of leasing lines from other carriers, similar to Telenet's operation, he said.

Most of Tymshare's lines are from AT&T, he said, although there may be a couple from MCI. Tymshare ceased using a Datran line about four weeks ago when it became apparent that Datran's financial problems were growing.

Contracts

Computer Sciences Corp.-Technicolor Associates have received a two-year, $24 million contract from the National Aeronautics and Space Administration for the continued management, operation and maintenance of computer systems and DP lines at Goddard Space Flight Center.

Burroughs Corp. has been awarded a $7.9 million contract by the Defense Communications Agency for lease of a special secure terminal comprised of devices from Burroughs' B700 family, for use by the joint chiefs of staff of the Department of Defense. The terminals will support part of the Improved Emergency Message Automatic Transmission Systems.

RCA has received $2.2 million from the U.S. Postal Service to provide a system definition and evaluation study for an Electronic Message Service.

RCA Service Co. has signed a contact with Avco Financial Services to provide maintenance for Avco's financial communications system, which includes about 1,100 hard-copy terminals.

Computer Products Unlimited has been awarded a contract from the Patuxant Naval Air Station for the Naval Undersea Center to supply the Navy with 30 CRT terminals and parts for 14 of the units.

Ampex Corp. has received a $300,000 contract for Ampex DM-313, 29M-byte disk drives and accessories to Stansaab Elektronik AB, also of Sweden.

Kennedy Co. has been awarded a $350,000 follow-on contract for Series 9000 tape transports from Data Pathing, Inc. to be used in Data Pathing's interactive terminal systems.

National Data Corp. has received a contract from Southeastern Data Cooperative, Inc. to provide DP services and facilities management for the association and its members. National Data also received a contract from Security Pacific National Bank of California to provide credit card authorization services.

International Communications Corp. has received a $1 million contract from Bunker-Ramo Corp. for 2,400 bit/sec modems, which will be built into Bunker-Ramo data controllers.

System Development Corp. has been awarded a $5.4 million contract from the National Oceanic and Atmospheric Administration to develop the Data Processing and Services Subsystem for the National Environmental Satellite Service's Tiros-N ground system.

The Nitron Division of McDonnell Douglas Corp. has received a contract from National Semiconductor Corp. to supply MNOS nonvolatile electronically eraseable read-only memory (Eerom) for use in National's 7100 programmable calculator.

Veripen, Inc. and Burroughs Corp. granted each other nonexclusive licenses for signature dynamics verification technology.

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Compiled and printed by Dr. John W. Hamblen and computer science students at the University of Missouri-Rolla. 100 pages.

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ACM '75: COMPUTERS AND THE QUALITY OF LIFE

Proceedings of the Annual Conference, Minneapolis, Minnesota, October 20-22, 1975. 372 pages.

ACM '75 gives wide-ranging consideration to the effects of computers on the quality of life, current and in the future. Topics presented include: Developing user-oriented business systems, Computer systems and the quality of health care, Computers in the electoral process, Computer science and the future.

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SELECTION AND ACQUISITION OF DATA BASE MANAGEMENT SYSTEMS

ACM is the sole source in North America for this Report of the CODASYL Systems Committee. March, 1976. 276 pages.

This report presents alternatives for the selection and acquisition of a data base management system as part of the development of an automated information processing system. It is the third in a series of CODASYL Systems Committee reports. It is addressed primarily to the team responsible for evaluating the needs for selection and acquisition of a data base management system.

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PRIVACY, SECURITY, AND THE INFORMATION PROCESSING INDUSTRY

A Report of the Ombudsman Committee on Privacy, Los Angeles Chapter, ACM, Dahl A. Gerberick, Chairman. March, 1976. 200 pages.

The report presents a set of guidelines for implementing the privacy/security recommendations in currently published studies, including administrative, technological and legal considerations.

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Amdahl Named Chairman

CIA Adds Communications to Name to Reflect Scope

By Toni Wiseman

Of the CW Staff

SAN FRANCISCO – The Computer Industry Association (CIA) changed its name to the Computer & Communications Industry Association (CCIA) during its annual meeting here.

At the same time, Dr. Gene Amdahl, chairman of the board of the Amdahl Corp., was elected chairman of the board of CCIA.

"The name change reflects what we've been doing for the last four years," according to Jack Biddle, CCIA president.

"We've been devoting about 40% of our energy, at least since the introduction of the [AT&T] Dataspeed 40 three years ago, to the opportunities and the challenges inherent in the rapid increase in the options available to the user as a result of advances in communications technology and competition in the communications market place.

"We have been concerned about the possible cross-subsidization of the Dataspeed 40 and about the marketing of the Dataspeed 40 as an OEM product in competition with independent vendors," he said.

"We have also been supportive of the specialized common carriers and the fact that they have contributed to a reduction in the cost of transmitting data which in turn increases the utility and utilization of DP equipment," Biddle stated.

Membership Encouraged

The association has always encouraged communications-oriented companies to be members, but had not, in the past, actively solicited them, Biddle observed.

It would be difficult to determine what percentage of the current membership is communications-oriented, he said, because of the blending which is taking place between computers and communications.

Memorex, for example, is fairly big in the front-end market and is therefore involved in communications, as is Itel with its substantial service bureau network, Biddle said.

In addition, several members manufacture modems, obviously interfacing with AT&T, "and we will be encouraging the independent communications equipment, front-end suppliers, specialized common carriers, PBX manufacturers and others to join with us to try and ensure that both marketplaces benefit from free and open competition," he stated.

While the CCIA has no plans for major reorganizations associated with the name change, the staff will be expanded by about 50% this year, Biddle said.

"We will also be following and supporting Congress in [its] efforts to understand the ramifications of the Bell bill, and we will continue our efforts to encourage AT&T to spin-off the Teletype Corp.," he said.

Amdahl Elected

Amdahl's election "will in part answer the question of why don't we have any mainframers," Biddle joked. "I think Gene Amdahl is an established mainframer."

Amdahl is also one of the seven original founders of the CIA.

"I think most people have by this time recognized that the worst thing we can be charged with is being in tune with the times and having an ability to anticipate the anticompetitive moves of both IBM and AT&T.

"I think a lot of people have begun to accept that we're not the wild-eyed radical group that they considered us to be four years ago," he said.

Biddle expects CCIA membership to expand significantly this year, both in the U.S. and overseas. Nixdorf and Transact are already members and he expects to bring in additional overseas independents "because many of the problems our industry faces are the same in Europe and Japan as they are here."

In view of its broadened base, the CCIA has reduced its dues structure by some 30% to open membership in the association to the widest possible cross-section of the computer and communications industries, he noted.

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Modem Makers Expedite Orders For Datran Users 'Left in Lurch'

(Continued from Page 33)

work, he noted, "because when you have very, very large contracts with a single supplier [such as Datran] your margins aren't all that good, but you basically make it up in volume.

"And when you're selling in small quantities to the end user, your margins are a little better – your cost of sales may be higher but your margins are better," he stated.

Robert Buddenstein, director of marketing for Paradyne, added, "There have been quite a few inquiries made and we are trying to help these people out of their predicament."

However, Paradyne's lead time is now 30 to 40 days after ordering, "and it's queuing up because of the volume we're pushing out and the rise in interest," he said.

Gandalf Shipments Suspended

Gandalf Data Communications Ltd. also had a contract to supply Datran, but shipments had been suspended, at Datran's request, since last May, according to president Des Cunningham.

"Datran's demise doesn't affect us tremendously because it never represented more than about 10% of our business, and it has paid for most of the equipment it had from us," Cunningham stated.

"There's a small amount of leasing money that was coming in on a monthly basis, but we have a security interest in that and we retain title to it," he added.

Gandalf had been supplying Datran with modems, mostly on a straight forward purchase basis, for about two and one half years.

The change in Datran's status won't affect Gandalf's production at all because "we have already had increases in sales greater than what we were supplying to Datran. It was not a large quantity in terms of the output we produce," he said.

"Basically, it's not going to affect us very much, except we won't get the business that we'd hoped to get from it during the next 10 years," Cunningham said.

Matthew Kenny, executive vice-president at ICC/Milgo said "Datran's closing its doors should mean an increase in modem business for us.

"And at the moment our sales force is indeed offering back-up service to former Datran users. The Datran digital service, as it was offered, is not compatible with the Bell [Direct Distance Dialing] and therefore we feel that we offer a viable alternative that will enable the user to get on-line immediately and keep his system running," he said.

Inquiries from Datran Users

ICC/Milgo has had several inquiries from Datran users and has already shipped equipment to some, "because when Datran stopped service it didn't mean the communications requirements on the part of the users stopped too," he said.

Kenny observed Milgo is not facing a lead-time problem and, in fact, "in order to serve the needs of the former Datran user, is attempting to give them preferential delivery whenever possible.

"It's as simple as either they get the equipment or they're out of business, so we have been trying very hard to help them keep their system on the air," he said.

Other manufacturers have not seen even the activity which Paradyne and ICC/Milgo have and do not expect any impact on their sales.

Comdata Corp.'s president Walter Manning noted that Datran's move "hasn't had any effect on us," adding that the reason might be Datran used high-speed modems and Comdata is not well-known in that market.

Arber Suit Charges Univac Defamation

(Continued from Page 33)

Athana packs cause head crashes, he continued.

But Athana has sold about 1,000 packs to Univac, has about 2,000 in the field, and has not had any complaints about the product, he said.

The suit also charges that Sperry Rand and various unnamed parties conspired to restrain trade in and monopolize the market for disk packs generally and for those compatible with the 8416 and 8418 drives.

Through its acquisition of ISS and Caelus, Arber charged, Sperry lessened competition in the manufacture and sale of packs and foreclosed to Arber and others the right to sell packs to Sperry, itself a substantial purchaser of disk packs prior to the acquisitions.

The suit seeks actual damages of not less than $17.5 million and $10 million in punitive damages.

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Will T/S Firms Using Datran Try Other Carriers?

By Molly Upton
Of the CW Staff

Will Data Transmission Co.'s (Datran) demise [CW, Aug. 30] deter users from trying other specialized common carriers?

A poll of some time-sharing (T/S) firms found a good number of past or present Datran users. Their reactions were varied on the subject of trying another independent specialized common carrier.

Bill Green, communications manager for Comshare, Inc., said he would try another independent carrier because he likes the idea of competition.

However, he added, he might not give as much business to an independent in the future as he gave to Datran and would probably move a little slower in switching to an independent.

But Richard Boyer, supervisor of network communications at Keydata Corp., said, "after getting burned once, I don't know whether we're going to want to try" another independent carrier.

Comshare was using four Datran circuits but Green had ordered facilities from AT&T two weeks prior to the Datran announcement, since he foresaw financial trouble ahead for Datran.

AT&T Did Tremendous Job

Comshare, as of the Friday after Datran was scheduled to go out of business, had gone completely to AT&T. Green attributed AT&T's quick work to the fact that he already had an order pending, but said AT&T did a tremendous job for him.

Green considers he got off Datran just in time. In fact, on Thursday night one line was down for about four hours, he said. Comshare did not have dial up backup on this particular line.

However, at Keydata, Boyer said on the Friday after Datran's scheduled demise, his six Datran lines were up and running alright.

But Datran service, some service bureaus said, was not all it might have been.

Green indicated the quality of service had not been very good.

Lou Falek, communications technician for Interactive Data Corp., said he found his Datran lines would drop out for three or four minutes during the wee hours of the morning, with causes unknown.

Also, he said the error rate was not as good as with Bell's Direct Distance Dialing.

Stayed With AT&T

Interactive Data had had one Datran circuit, which was being used as an extra, while the firm evaluated increasing its business with Datran, Falek said.

However, it found sufficient glitches to warrant paying the additional money and staying with AT&T, he said.

On-Line Systems, Inc. had tried four Datran circuits last winter and found them too unreliable, according to Dennis Kolb, manager of communications.

Now it has mostly AT&T lines with a few Southern Pacific Communications Co. circuits, he said.

Kolb indicated he had noticed five or six different problems on the Datran 9,600 bit/sec Datadial lines between his center in Pittsburgh and New York City during the three months he used them. Datran took four or five hours to restore service, he said.

Keydata, which previously used AT&T exclusively, had switched to Datran for connections to nine cities.

'Roof Caved In'

"When the roof caved in," Boyer reordered AT&T and put in orders under an open order policy with Milgo Electronics Corp. and Paradyne Corp.

By Thursday, the day Datran was scheduled to quit, Keydata had four circuits installed and the other three were scheduled to be in on Friday.

Boyer was faced with the need to distribute modems to the various cities being converted to the AT&T service. He received Milgo's 2400 bit/sec modems the same day he ordered them and Paradyne's 9,600 bit/sec units by Thursday, he said.

Profligacy repealed:

Read our special report on *Supplies and Security* in the September 27th *Computerworld*.

Harry S. Truman, in his oft-quoted phrase on our improvident ways, admonished us to "Use it up, wear it out, make it do, or do without." As much as it made sense to the sugar-saving housewives of 1946, that wartime motto is excellent advice for the computer rooms of today. Our September 27th supplement, titled *Supplies and Security*, takes that advice, and we'll show you some innovative ways to save money by conserving supplies.

Edited by Drake Lundell, this Supplement will cover all the things you feed your computer system, including tapes, disks, cards, paper and forms. Miniaturization of the supplies you use has the added benefit of saving storage space as well as using less material -- and this supplement will examine equipment that does this, such as computer output microfilm and photo-reducing copiers.

We'll also address the subject of security in this report. Diabolical threats like dust, excess humidity, fires, floods, theft or sabotage could bring your computer operations to a grinding halt. We'll review the risks -- especially in the area of physical security -- and report on ways you can reduce your exposure to them.

Anyone who manages computer systems will find important and useful information in our September 27th supplement. And if you're a marketer of computer supplies or security products or services, you should advertise them here. Ad closing date is September 10th. Contact your *Computerworld* salesman for complete details. Or call Judy Milford at (617) 965-5800.

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Computer Store Opens Hobbyist's Heaven

BOSTON – A computer hobbyist's heaven has opened here under the name of the Computer Warehouse Store.

Centered around a supply of microcomputer kits from major kit suppliers such as IMS Associates and Southwest Technical Products, the Computer Warehouse offers both beginner and advanced computerniks everything needed to set up a system, according to American Used Computer Corp., the parent company.

Used Gear Too

The Warehouse also has 7,500 sq-ft of used accessory gear that includes minicomputers, major brands of commercial grade peripheral equipment, as well as boxes of parts such as connectors, transformers and metal cabinets.

The store also stocks new CRT terminals and monitors from Lear Siegler Inc. and Sanyo.

In addition, the store said it offers trouble-shooting service and help to its kit-builders if they get in trouble.

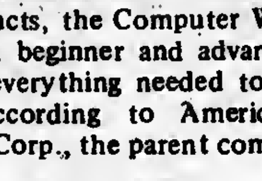
The Warehouse is located at 584 Commonwealth Ave., Boston, Mass. 02215.

Carlyle Corp. Formed

LOS ANGELES – The David Jamison Carlyle Corp. has recently been formed as a distributor of terminals.

President Dennis Cagan indicated the firm will specialize in marketing to the sophisticated end user and medium sized OEMs.

The firm is at 1888 Century Park East, Suite 833, Los Angeles, Calif. 90067.



DEVOTED DPER

This gold-finished plaster sculpture symbolizes the DP professional's computer fixation. Six inches long, this hefty paperweight-conversation piece is priced at $9.95, postpaid, from Brian Productions, 2949 Southfield Rd., Xenia, Ohio 45385. Satisfaction guaranteed.

Ampex 'Ahead' of Original Planning As First Quarter Earnings Rise 16%

REDWOOD CITY, Calif. – Ampex Corp. is "somewhat ahead" of its original planning, according to Chairman Richard J. Elkus, who told stockholders the firm's first quarter earnings rose 16% to $1.8 million compared with $1.6 million in the same period last year.

Revenues rose to $65.4 million compared with $63.6 million in the year-ago period.

"We are particularly pleased with these improvements in earnings as they have come at a time when we are changing over to new products in many areas," Elkus commented.

Arthur H. Hausman, president, observed the firm is well positioned to take advantage of expected growth in its three main product areas: audio-video, blank magnetic tape and data-memory products.

The firm has experienced a "significant boost" in its share of the core memory products market, he said, adding the Unibit core accounted for more than 50% of Ampex's core production in fiscal 1976.

Hausman observed that when extraordinary items, nonrecurring income and discontinued operations are disregarded, pretax income during fiscal 1976 "from the businesses Ampex was in and expects to continue in" rose nearly 90% over fiscal 1975.

Adapso to Brief Analysts

NEW YORK – The Association of Data Processing Service Organizations' (Adapso) third annual financial analysts meeting will be held Sept. 30 in the Waldorf-Astoria here from 9 a.m. to noon.

International Data Corp. will present its marketing, financial and statistical survey of the computer services industry which it prepared in conjunction with Adapso.

There is no charge for attendance by financial analysts.

There will also be presentations by industry authorities on data communications, mini and micro-mini computers, electronic funds transfer systems (EFTS) and how each topic relates to the future growth of the computer services industry.

The presentation on data communications will be made by Dr. Dixon Doll, president of DMW Telecommunications Corp.; on mini and micro-mini computers by Harry Edelson, computer industry analyst at Drexel-Burnham; and EFTS by James Peacock, editor of *Autotransaction Industry Report*.

Adapso is at 210 Summit Ave., Montvale, N.J. 07645.

Orders & Installations

Mountain States Telephone Co. has installed a Videocomp 500 typesetter from Information International, Inc. for use in converting its telephone directories from hot type to photocomposed listings on magnetic tape.

The *New Bedford Standard Times* has ordered a Harris 2200 display advertising layout system to replace three of the Varicomp 3000 displays currently in use.

The Florida Publishing Co. is installing an Amcomp 6000 copy management system from Amcomp Corp., formerly Data Disc.

The U.S. Army Missile Command has ordered a Univac 1108-II computer system from American Used Computer Corp. for the Redstone Arsenal.

Olin Winchester Corp. has ordered five voice data-entry terminals from Threshold Technology, Inc. to aid in serial number control of rifles and shotguns.

The State of Texas' Comptroller's Office has ordered 41 Sycor 250 intelligent stand-alone, online terminals and an equal number of printers for use in a statewide taxpayer information system.

Exxon has installed a dual Emcon computer-based scan alarm/log system from EMC Controls, Inc. for its Baytown Fuels expansion.

Lockwood Corp. has ordered a Production IV manufacturing management system from Informatics, Inc. for a new Lockwood plant under construction.

Alaska Airlines has installed a Univac 90/30 to handle financial reporting applications previously run at a service bureau.

Texas City Refining, Inc. has ordered a Univac 1100/10 system for simulation work on refining processes, modeling, planning, economics and general accounting.

Farmers Insurance of Los Angeles has ordered nine data entry systems from General Computer Systems, Inc.

Pier I Imports, based in Ft. Worth, Texas, has ordered an NCR Criterion for inventory control and general accounting for its 260 shops.

Bassick Co., a division of Stewart Warner Corp., has ordered special computer software for an on-line order entry and allocation accounting system from Real-Time Computer Systems, Inc.

Kaser Corp. of Des Moines, Iowa, has installed a Burroughs B1700 system for use by its affiliate, Kaser Computing Services, Inc.

Security Pacific Bank has ordered Model 750 transaction terminals from Concord Computing Corp. for installation in selected supermarkets to test the bank's check authorization program.

New Registrations

ALANTHUS CORP., 111 High Ridge Rd., Stamford, Conn. 06905, a lessor of computers and duplicating equipment, filed to register 1 million shares of common and 550,000 warrants to purchase 550,000 shares of common, to be offered for sale in units consisting of two shares of common and one warrant. Underwriters are C.E. Unterberg, Towbin Co., 61 Broadway, New York, N.Y. 10006.

LEXICON CORP., P.O. Box 440246, Tamiami Station, Miami, Fla. 33144, a research and development company, filed to register 200,000 shares of common, to be offered for sale at $5.00 per share through the user. No underwriter is involved.

MINI-COMPUTER SYSTEMS, INC., 525 Executive Blvd., Elmsford, N.Y. 10523, filed to register 200,000 shares of common, to be offered for sale on behalf of the company and 27,751 shares of common on behalf of certain selling stockholders. The statement also covers 12,000 shares issuable upon exercise of outstanding warrants. Underwriters Evans & Co., Inc., 300 Park Ave., New York, N.Y. 10022.

POSITION ANNOUNCEMENTS

Programmer Analyst

Old Dominion University invites applications for a Computer Analyst/Programmer on a three year NSF-funded project for the improvement of science education with possible continuation beyond the duration of the grant with the University Computer Center. Candidates should have a B.S. in Computer or Physical Sciences, at least two years of experience in the creation and maintenance of computer assisted and computer managed instructional software as well as experience with the DEC system-10 or other major time-sharing systems and University computer facilities. Salary range is $13,500 to $15,000 depending on experience. Candidates should forward resume and two letters of reference to Dr. Dennis A. Darby, ODU-CAUSE Coordinator, Dept. of Geophysical Sciences, Old Dominion University, Norfolk, Va. 23508. *Old Dominion University is an equal opportunity affirmative action employer.*

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The George Washington University has an immediate opening for Director of the Computer Center. Combined academic and administrative computing (370/145). Applicants should have advanced degree, significant experience in a technical role, and as a manager of computing in an academic institution. First rate communication, leadership and interpersonal skills are required. Interested individuals should send resume in confidence to CW Box 4751, 797 Washington St., Newton, Mass. 02160 by Sept. 30, 1976.

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position announcements

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South & Southwest: Atlanta (404/634-5127), Dallas (214/638-4080), Fort Worth (817/338-9300), Houston (713/626-8705), New Orleans (504/523-2576).
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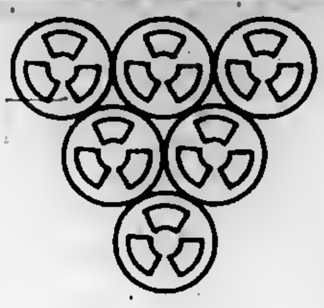

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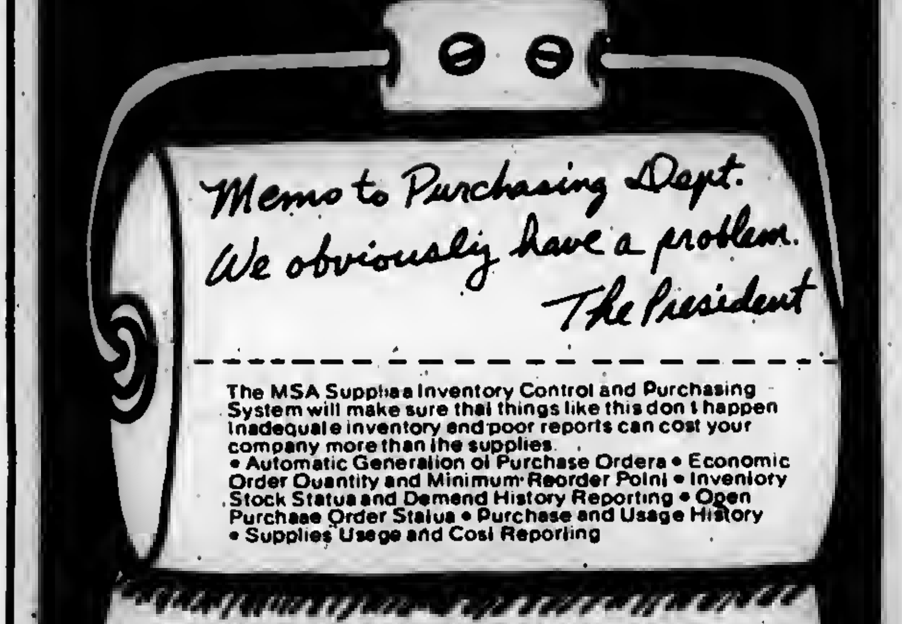
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Tax Credits Harm Data 100 Earnings

MINNEAPOLIS – Although Data 100's operating income improved in both the second quarter and six months compared with the year-ago figures, earnings were less in both periods, reflecting the smaller tax credits in the recent periods.

In addition, there was a $400,000 foreign exchange loss in the second quarter.

Revenues for the quarter rose to $28.4 million compared with $22.5 million in the same period last year.

Earnings totaled $1.4 million or 35 cents a share, including a $359,000 tax loss carryforward compared with earnings of $1.6 million or 39 cents a share in the 1975 quarter when the tax credit was $678,000.

During the six months, revenues rose to $57.7 million compared with $43.4 million in the same period last year.

Earnings dipped to $2.4 million or 60 cents a share, including a $485,000 tax credit, compared with nearly $3 million or 74 cents a share last year, when there was a $1.3 million tax credit.

The firm's 1976 revenues include nonrecourse sales to third party leasing companies of $3.4 million in the second quarter and $8.4 million in the six months.

There were no such sales in the first six months of 1975.

Cray Has Least Loss Yet

MINNEAPOLIS – Cray Research, Inc. reported a second quarter loss of $289,019 or 21 cents a share.

For the six months, Cray realized a $579,948 loss, bringing its cumulative loss since 1972 to $3 million.

The company is still in the development stage and has had no sales or earnings from operations.

During the second quarter, however, the firm was awarded a contract for installation of a Cray-1A at the National Center for Atmospheric Research (Ncar), according to President Seymour R. Cray.

The contract provides for delivery on July 1, 1977 and acceptance after system performance standards are met. Ncar has the option to lease the system on a monthly basis or purchase.

Centronics Sees Gain in Year

HUDSON, N.H. – Despite a $1.8 million write-off from its European distributors, Core GmbH and Core Ltd., Centronics Data Computer Corp.'s earnings increased 33%.

Earnings for the fiscal year ended June 30 were $9.76 million or $2.02 a share compared with earnings of $7.28 million or $1.52 a share for 1975.

Earnings increased despite the fact that Centronic's income after taxes reflects an earnings reduction of 23 cents a share attributed to the write-off of $1.8 million in receivables from the company's former European distributors.

The firm had instituted actions in England and Germany to obtain court orders to preserve and freeze all assets of its two distributors, pending action to recover over $1.8 million owed to Centronics [CW, July 30, 1975].

Revenue for the year was $52.1 million compared to $41.5 million last year.

MSI Earnings Rise 73%

COSTA MESA, Calif. – MSI Data Corp.'s earnings from continuing operations soared 73% in the first quarter.

Revenues were also up slightly.

Earnings for the quarter were $626,344 or 32 cents a share compared with $219,244 or 18 cents a share in the year-ago quarter.

The 1976 figure reflects a decrease in interest expense from $185,756 in 1975 to $3,065 in 1976. MSI also recorded a $142,756 change in 1975 from operations of Astros business prior to its discontinuance.

Revenues of $8.6 million for the first quarter were 5% greater than last year's nearly $8.3 million.

MSI's backlog at the end of the quarter was $10.9 million compared with $8.8 million in the year-ago period.

"These very favorable results reflect recent improvements in both customer orders and in profit margins," according to William J. Bowers, chairman.

Profit margins have been improved by reducing overhead and product costs and by eliminating interest costs after repaying bank loans, he noted.

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Alanthus Nine Month Earnings Dip With Deferred Tax Credit Method

STAMFORD, Conn. – Alanthus Corp.'s earnings dropped almost 70% for the nine months with a provision for changing to the deferral method of accounting for investment tax credits.

Earnings were $435,000 or 29 cents a share compared with $1.3 million or 85 cents a share in the year-ago period. If restated on a pro forma basis, Alanthus' earnings for the 1975 period would be $1 million, the firm said.

The change in accounting from the flow-through to the deferral method will enable the firm to defer the $698,000 provision and apply it to reduce income taxes in future periods.

Revenues for the period were $20.5 million compared with $17.1 million a year ago.

A provision of $698,000 or 57 cents a share was taken against current earnings to recognize the cumulative effect of the change.

Alanthus has also secured a $30 million line of credit from Chemical Bank.

Boothe Sales Better in Quarter, Six Months; But Earnings Fall

SAN FRANCISCO – Although Boothe Computer Corp. showed increased revenues for both the second quarter and six months ended June 30, earnings were below those of the year-ago periods.

In the quarter, earnings were $1.05 million or 28 cents a share compared with $3.9 million or $1.01 a share in the same period last year.

Revenues rose to $14.5 million compared with $10.1 million in the year-ago quarter.

During the six months, earnings reached nearly $1.8 million or 46 cents a share compared with $4 million or $1.03 a share in the same year-ago period.

These Securities having been sold, this announcement appears as a matter of record only.

NEW ISSUE August 25, 1976

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Tektronix Results Up

BEAVERTON, Ore. – Tektronix, Inc. reported a 14% increase in earnings coupled with a 9% increase in revenue for 1976.

Earnings for the year ended May 29 were $30.1 million or $3.43 a share compared with $26.3 million or $3.04 a share a year ago.

Revenue for the period was $366.6 million compared with $336.6 million in 1975.

A strong domestic order pattern in the second half resulted in a 14% gain in orders.

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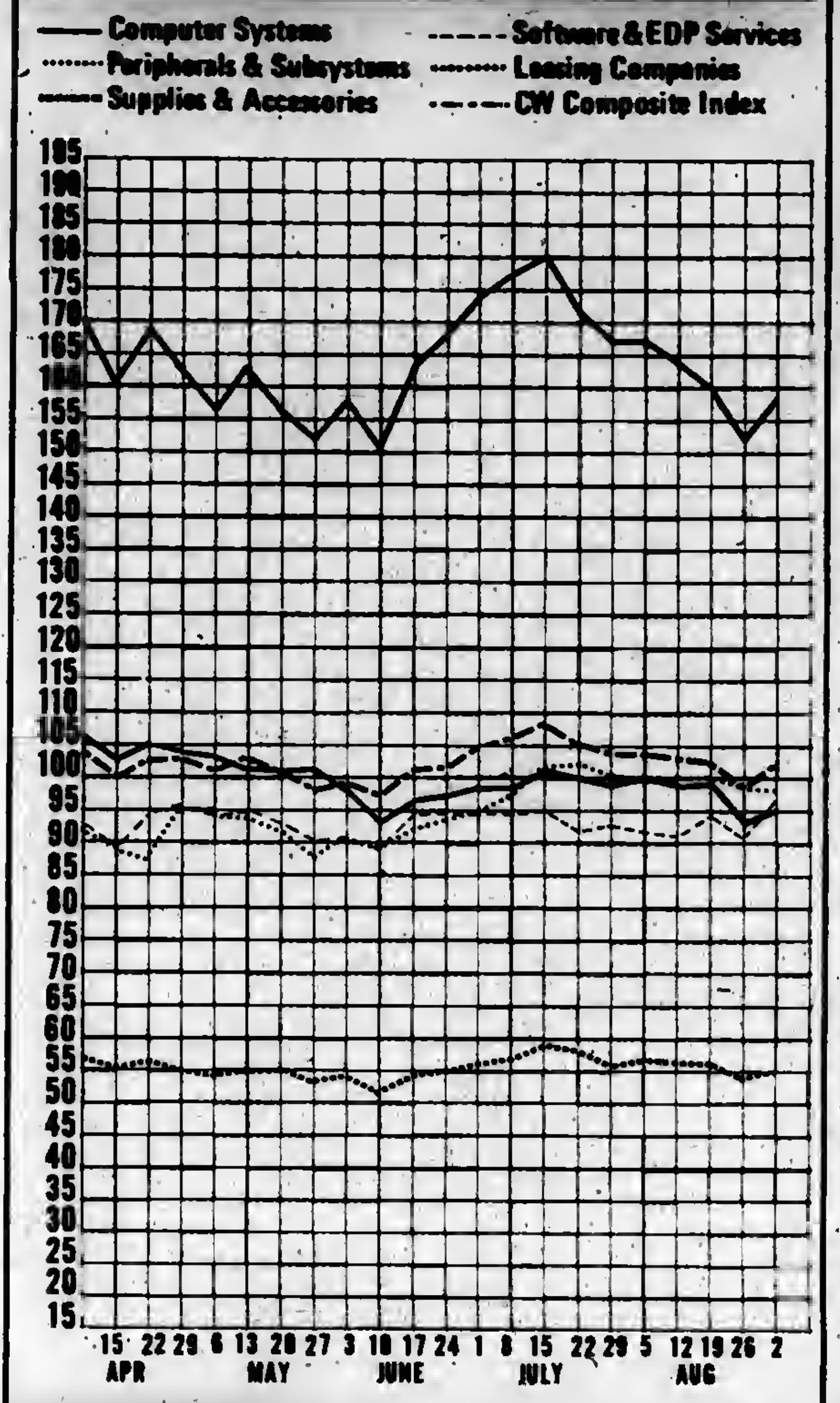

Earnings Reports

MICRODATA
Three Months Ended May 31

	1976	1975
Shr Ernd	$.40	$.20
Revenue	8,508,214	3,820,338
Tax Cred	.....	116,000
Earnings	882,354	318,391
9 Mo Shr	1.01	.23
Revenue	19,665,311	10,679,575
Tax Cred	.....	134,000
Earnings	1,883,642	364,350

MICROFORM DATA SYSTEMS
Three Months Ended April 30

	1976	1975
Shr Ernd	$.08	$.11
Revenue	4,611,766	5,714,540
Tax Cred	243,200	279,909
Earnings	459,319	583,144
9 Mo Shr	.26	.21
Revenue	14,853,989	13,348,070
Tax Cred	700,400	515,399
Earnings	1,411,775	1,073,750

MILGO ELECTRONICS
Three Months Ended March 31

	1976	1975
Shr Ernd	$.31	$.73
Revenue	9,845,000	10,578,000
Earnings	545,000	1,218,000
6 Mo Shr	.52	1.44
Revenue	18,939,000	20,788,000
Earnings	905,000	2,394,000

MANUFACTURING DATA SYSTEMS
Three Months Ended May 31

	1976	1975
Shr Ernd	$.18	$.17
Revenue	4,583,000	3,131,000
Earnings	532,000	388,000
9 Mo Shr	.48	.37
Revenue	11,834,000	8,312,000
Earnings	1,267,000	832,000

RECOGNITION EQUIPMENT
Three Months Ended April 30

	1976	1975
Shr Ernd	$.25	$.12
Revenue	16,664,000	18,727,000
Tax Cred	490,000	200,000
Earnings	1,464,000	694,000
6 Mo Shr	.51	.24
Revenue	33,261,000	29,012,000
Tax Cred	1,067,000	741,000
Earnings	2,968,000	1,349,000

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, SEPTEMBER 1, 1976

All statistics compiled, computed and formatted by
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Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		PRICE 1976 RANGE (1)	CLOSE SEP 1 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	84-108	93 7/8	+2	+2.1
O	COMPUTER AUTOMATION	10- 19	17	+2 1/8	+14.2
N	CONTROL DATA CORP	18- 27	23 1/4	+1 1/8	+5.0
N	DATA GENERAL CORP	40- 60	48 3/4	+1 1/8	+2.3
O	DATAPOINT CORP	24- 46	36	+3	+9.0
O	DIGITAL COMP CONTROL	2- 7	5 3/8	+ 1/8	+2.3
N	DIGITAL EQUIPMENT	138-191	163 3/4	+ 1/2	+0.3
N	ELECTRONIC ASSOC.	2- 5	2 1/2	- 1/8	-4.7
A	ELECTRONIC ENGINEER.	7- 16	8 1/2	0	0.0
N	FOXBORO	28- 47	46 3/8	+2 1/8	+4.8
O	GENERAL AUTOMATION	5- 11	7	+ 1/8	+1.8
O	GRI COMPUTER CORP	1- 1	5/8	+ 1/8	+25.0
N	HEWLETT-PACKARD CO	85-117	90 3/4	+3 3/4	+4.3
N	HONEYWELL INC	34- 58	45 1/4	+ 5/8	+1.4
N	IBM	227-280	276 7/8	+4 7/8	+1.7
O	MANAGEMENT ASSIST	1- 3	1 3/4	- 1/8	-6.6
O	MEMOREX	18- 33	22 1/2	- 1/4	-1.0
O	MICRODATA CORP	10- 27	26	+2	+8.3
O	MODULAR COMPUTER SYS	3- 14	5	- 1/4	-4.7
N	NCR	24- 36	33 7/8	+ 3/4	+2.2
O	PRIME COMPUTER INC	4- 14	12	+ 1/2	+4.3
N	PERKIN-ELMER	19- 27	21 1/4	+ 3/4	+3.6
N	RAYTHEON CO	45- 66	59 1/2	+ 1/4	+0.4
N	SPERRY RAND	40- 52	47 1/2	+3 1/2	+7.9
O	SYCOR INC	19- 31	22	+1	+4.7
A	SYSTEMS ENG. LABS	6- 10	7	- 7/8	-11.1
N	VARIAN ASSOCIATES	13- 17	14 1/4	+ 5/8	+4.5
A	WANG LABS.	11- 20	18 1/2	+1 1/4	+8.1

LEASING COMPANIES

EXCH		PRICE 1976 RANGE (1)	CLOSE SEP 1 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMDISCO INC	3- 10	7 1/2	0	0.0
A	COMMERCE GROUP CORP	2- 3	2 3/8	- 3/8	-13.6
A	COMPUTER INVSTRS GRP	1- 3	2	0	0.0
N	DATRONIC RENTAL	0- 1	1 1/8	0	0.0
A	DCL INC	1- 1	5/8	0	0.0
N	DPF INC	5- 8	6 3/4	+ 1/4	+3.8
A	GREYHOUND COMPUTER	3- 8	7 1/4	- 1/8	-1.6
N	ITEL	6- 15	12 1/4	- 1/8	-1.0
N	LEASCO CORP	6- 19	18 3/4	+1 1/2	+9.8
O	LEASPAC CORP	0- 1	1/4	0	0.0
O	NRG INC	0- 1	3/8	0	0.0
A	PIONEER TEX CORP	6- 9	6 3/4	- 7/8	-11.4
N	U.S. LEASING	7- 12	9	0	0.0

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

SOFTWARE & EDP SERVICES

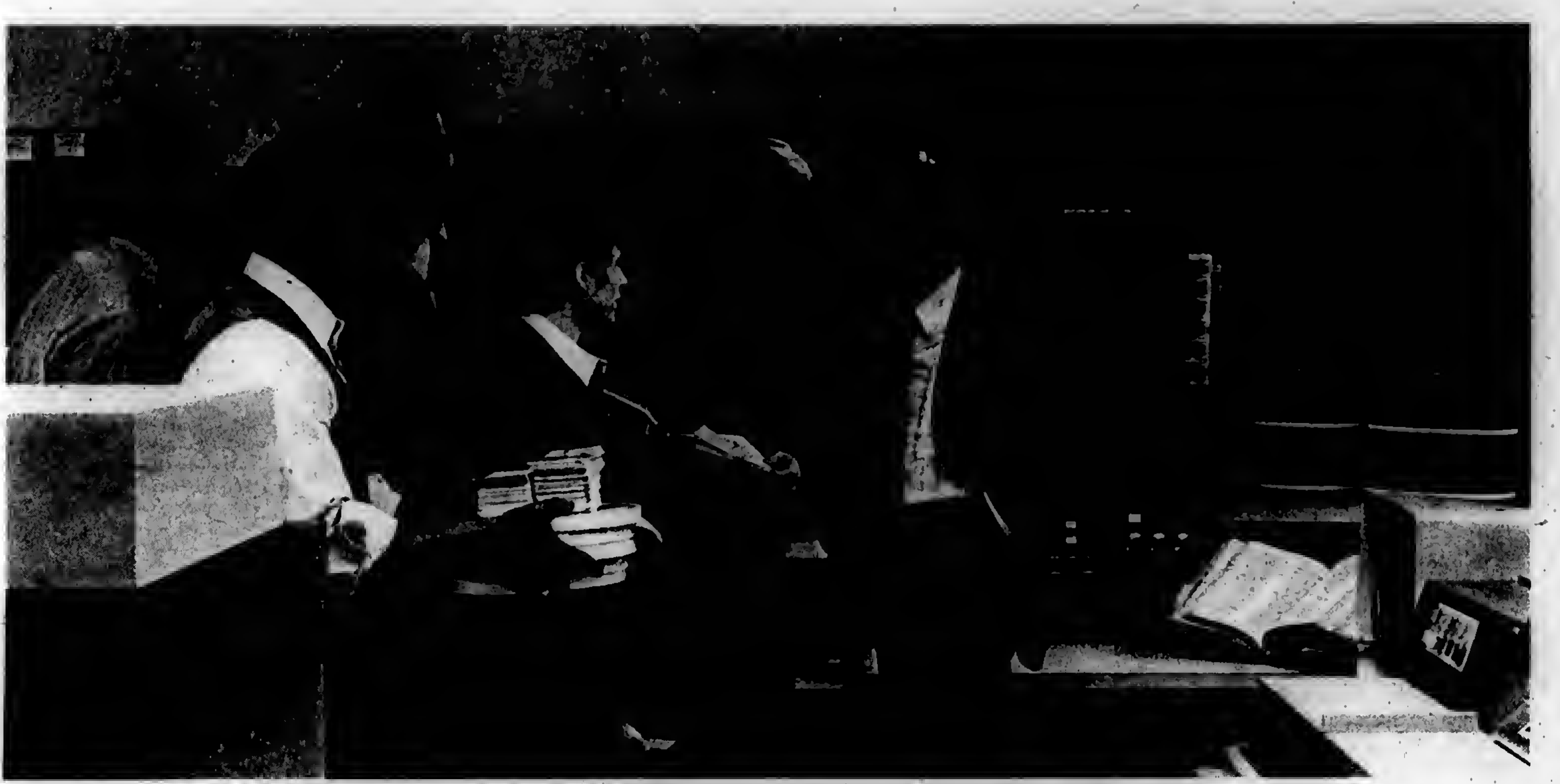
EXCH		PRICE 1976 RANGE (1)	CLOSE SEP 1 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 3	2	0	0.0
O	ANACOMP INC	8- 11	8	- 1/8	-1.5
A	APPLIED DATA RES.	2- 4	3 5/8	- 1/8	-3.3
N	AUTOMATIC DATA PROC	17- 35	31	+ 3/8	+1.2
O	COLEMAN AMERICAN COS	2- 6	2 1/4	- 1/4	-10.0
O	COMPUTER DIMENSIONS	3- 7	5 1/4	0	0.0
O	COMP ELECTION SYSTMS	5- 9	5 3/4	+ 1/2	+9.5
O	COMPUTER HORIZONS	1- 2	1 3/4	0	0.0
O	COMPUTER NETWORK	2- 6	3 5/8	0	0.0
N	COMPUTER SCIENCES	4- 8	8 1/4	0	0.0
O	COMPUTER TASK GROUP	1- 1	1	- 3/8	-27.2
O	COMPUTER USAGE	3- 4	3	0	0.0
O	COMSHARE	2- 9	5 3/4	+ 3/4	+15.0
O	DATA DIMENSIONS INC	2- 4	2 3/4	0	0.0
O	DATATAB	1- 1	1 3/8	+ 1/8	+10.0
N	ELECTRONIC DATA SYS.	12- 18	16 1/2	- 1/2	-2.9
O	INFONATIONAL INC	1- 1	3/8	+ 1/4	+200.0
O	INSYTE CORP	1- 3	1 7/8	+ 3/8	+25.0
O	IRS-COMPUTER MARKET.	1- 2	1 1/8	0	0.0
O	KEANE ASSOCIATES	2- 4	2 5/8	+ 1/4	+10.5
O	KEYDATA CORP	2- 5	2	+ 1/8	+6.6
O	LOGICON	3- 4	3 1/2	- 1/8	-3.4
A	MANAGEMENT DATA	1- 3	2 1/4	+ 1/4	+12.5
A	NATIONAL CSS INC	13- 25	22 1/4	+ 1/2	+2.2
A	ON LINE SYSTEMS INC	18- 22	20	+ 1/8	+0.6
N	PLANNING RESEARCH	3- 5	3 7/8	+ 3/8	+10.7
O	PROGRAMMING & SYS	1- 1	3/8	0	0.0
O	RAPIDATA INC	2- 5	2 1/4	0	0.0
O	REYNOLDS & REYNOLD	13- 21	15 3/4	- 1/4	-1.5
O	SCIENTIFIC COMPUTERS	1- 1	3/4	0	0.0
O	TYMSHARE INC	19- 28	24 3/4	- 5/8	-2.4
A	URS SYSTEMS	3- 5	3 3/8	- 1/4	-6.8
N	WYLY CORP	2- 7	1 1/2	- 1/4	-14.2

PERIPHERALS & SUBSYSTEMS

EXCH		PRICE 1976 RANGE (1)	CLOSE SEP 1 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	8- 13	9 1/4	+ 1/8	+1.3
O	ADVANCED MEMORY SYS	4- 10	6 1/8	- 1/4	-3.9
N	AMPEX CORP	5- 10	7 3/8	- 1/4	-3.2
O	ANDERSON JACOBSON	2- 4	2 3/4	0	0.0
O	APPLIED DIG DATA SYS	13- 25	21 1/4	+2	+10.3
O	BEEHIVE MEDICAL ELEC	3- 9	8	+ 1/4	+3.2
A	BOLT,BERANEK & NEW	7- 11	7 7/8	- 7/8	-10.0
N	BUNKER-RAMO	5- 10	7 1/2	- 1/4	-3.2
A	CALCOMP	4- 7	4 7/8	- 1/8	-2.5
O	CAMBRIDGE MEMORIES	0- 6	5/8	0	0.0
N	CENTRONICS DATA COMP	20- 36	30 5/8	- 3/8	-1.2
O	CODEX CORP	22- 42	37	+2 1/2	+7.2
O	COGNITRONICS	1- 1	7/8	0	0.0
O	COMPUTER COMMUN.	1- 6	5 1/8	- 1/8	-2.3
O	COMPUTER CONSOLES	4- 7	5 3/4	0	0.0
A	COMPUTER EQUIPMENT	1- 3	1 5/8	0	0.0
O	COMPUTER TRANSCEIVER	1- 3	7/8	0	0.0
O	COMTEN	4- 9	7	+ 1/2	+7.8
N	CONRAC CORP	20- 25	21 5/8	+1 3/8	+6.7
O	DATA ACCESS SYSTEMS	1- 4	3 3/4	+ 1/2	+15.3
O	DATA 100	7- 13	8 7/8	+1	+12.6
A	DATA PRODUCTS CORP	5- 15	13	+ 1/2	+4.0
O	DATA TECHNOLOGY	1- 2	1 3/4	+ 1/8	+7.6
O	DATUM INC	1- 2	1 1/2	0	0.0
O	DECISION DATA COMPUT	1- 4	1 1/2	+ 1/8	+9.0
O	DELTA DATA SYSTEMS	1- 1	1 1/4	+ 1/4	+25.0
N	ELECTRONIC M & M	1- 4	3 5/8	+ 1/4	+7.4
O	FABRI-TEK	1- 1	3/4	+ 1/8	+20.0
O	GENERAL COMPUTER SYS	1- 2	1 1/8	0	0.0
N	HAZELTINE CORP	4- 12	8 1/2	+ 3/4	+9.6
N	HARRIS CORP	34- 55	52 3/4	+1 3/4	+3.4
A	INFOTERM CORP	9- 20	9 1/4	+ 3/8	+4.2
O	INFOREX INC	3- 7	4	+ 1/8	+3.2
O	INFORMATION INTL INC	10- 18	11 1/4	- 3/8	-3.2
O	INTEL CORP	59-109	62	+ 1/2	+0.8
A	LUNDY ELECTRONICS	4- 7	3 1/2	- 1/4	-6.6
O	MSI DATA CORP	3- 7	6 1/4	+ 1/8	+2.0
A	MILGO ELECTRONICS	15- 21	15 3/4	- 1/8	-0.7
N	MOHAWK DATA SCI	3- 10	7 3/8	- 3/4	-9.2
O	PENRIL CORP	1- 3	2 1/8	- 1/8	-5.5
A	PERTEC CORP	3- 8	7 3/8	+ 3/4	+11.3
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	5- 10	4	- 1/2	-11.1
O	QUANTOR CORP	4- 6	4 1/4	- 1/4	-5.5
O	RECOGNITION EQUIP	6- 11	7 1/4	- 1/8	-1.6
N	SANDERS ASSOCIATES	6- 11	8 5/8	+ 5/8	+7.8
O	SCAN DATA	2- 4	2	0	0.0
O	STORAGE TECHNOLOGY	9- 13	11 3/8	+ 3/8	+3.4
O	T BAR INC	5- 10	5 5/8	+ 1/8	+2.2
O	TALLY CORP.	4- 8	4	- 1/4	-5.8
O	TEC INC	3- 5	4	+ 1/4	+6.6
N	TEKTRONIX INC	45- 67	59	-2 1/8	-3.4
N	TELEX	2- 5	3	0	0.0
O	WANGCO INC	11- 22	21 1/8	0	0.0
O	WILTEK INC	2- 2	2 1/4	- 1/8	-5.2

SUPPLIES & ACCESSORIES

EXCH		PRICE 1976 RANGE (1)	CLOSE SEP 1 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED SYSTEMS INC	1- 4	3 1/4	0	0.0
O	BALTIMORE BUS FORMS	3- 5	2 3/4	- 1/4	-8.3
A	BARRY WRIGHT	6- 10	7 1/2	+ 1/8	+1.6
O	CYBERMATICS INC	1- 1	1/2	0	0.0
A	DATA DOCUMENTS	25- 42	27 1/4	+1 7/8	+7.3
O	DUPLEX PRODUCTS INC	13- 24	13 1/2	- 3/8	-2.7
N	ENNIS BUS. FORMS	6- 8	6 1/4	- 1/8	-1.9
O	GRAHAM MAGNETICS	8- 13	9 1/2	+ 1/4	+2.7
O	GRAPHIC CONTROLS	13- 19	15 1/4	+ 1/2	+3.3
N	3M COMPANY	53- 65	62 5/8	+1	+1.6
O	MOORE CORP LTD	38- 51	38 1/2	0	0.0
N	NASHUA CORP	11- 18	16 5/8	+ 3/8	+2.3
O	STANDARD REGISTER	15- 19	15 1/2	+ 1/4	+1.6
O	TAB PRODUCTS CO	5- 11	9 1/4	+ 1/4	+2.7
N	UARCO	20- 25	20 1/4	0	0.0
A	WABASH MAGNETICS	4- 8	7 1/4	+ 1/4	+3.5
N	WALLACE BUS FORMS	19- 25	20 1/4	- 3/8	-1.8



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NEWSPAPER

FTC Quietly Probing TRW Security Measures

WASHINGTON, D.C. – The Federal Trade Commission (FTC) has begun a nonpublic investigation of TRW Credit Data to determine whether the firm takes reasonable precautions to ensure the accuracy of its files.

Under the Fair Credit Reporting Act, firms are required to take "reasonable procedures to assure the maximum possible accuracy" of the reports they send out on individuals.

The investigation, which was confirmed by TRW last week, presently involves just TRW, but could be broadened to include the entire credit-reporting industry, sources said.

The FTC has not said why it began the inquiry into TRW, but it is apparently unrelated to the indictments handed down against six people last week for altering records in TRW's computerized files.

TRW keeps files on 50 million people, a spokesman said, adding that only 2% of its reports are challenged every year.

The total number of files that contain inaccurate or outdated information is open to some dispute, but in 1974 Ray Yhaben, currently vice-president of TRW Information Services, which runs TRW Credit Data, told a National Computer Conference audience that "only one-third" of the records contested by consumers were inaccurate or needed some update.

Ybaben said at that time that the firm received only 2,000 inquiries per year before the Fair Credit Reporting Act was passed requiring that individuals be notified as to why they were turned down for credit.

With the requirement for notification, he said, the inquiries had increased a hundredfold to 200,000 annually. "Only one-third" of those inquiries resulted in a file either being corrected or updated, he said then.

Last week a TRW spokesman con-

(Continued on Page 4)

Six Charged With Altering TRW Credit Data Files As FBI Breaks L.A. Ring

By Molly Upton
And E. Drake Lundell Jr.
Of the CW Staff

LOS ANGELES – Six people have been indicated here for manipulating credit-rating records kept in the nation's largest computerized credit data bank.

The indictment charged the six worked with an employee of TRW Credit Data to alter the records of 16 individuals, although TRW had previously warned banks and other credit granters the records of over 100 people may have been altered by the ring.

TRW collects and disseminates credit information on about 50 million individuals to its customers, which are credit granters such as banks, stores and credit-card companies.

The six indicted were allegedly aided in the fraud by a TRW employee, Kathleen Bennett, who, according to the indictments, actually altered the records. Bennett was a clerk in the consumers relations department of the firm.

When the scheme was uncovered TRW dismissed Bennett, who is now cooperating with the investigators, according to Frank Keer, a district attorney prosecuting the case.

Tip-Off Not From TRW

The initial tip-off of the scheme was given to the Federal Bureau of Investigation, he added, and did not come from TRW itself.

While prosecutors would not say where the original tip came from, reportedly an individual who had been approached in a bar and offered a clean credit slate for $600 first contacted the FBI.

Allegedly the six men charged people with bad credit ratings a fee to alter the records either to delete derogatory credit information or to add favorable information to the files.

Under the Fair Credit Reporting Act, each company that sells credit information, like TRW does, must have a consumer relations department to investigate complaints from consumers about their credit reports.

Bennett, according to the indictment, was just a clerk in that department, but she was still able to enter information into the system. In at least 16 cases detailed in the indictment, she used her position to either delete or add information to existing files, the indictment said.

"She would send items into the system,

(Continued on Page 4)

Schaefer Alleges Negligence

Beermaker Sues EDS for $115 Million

By Toni Wiseman
Of the CW Staff

NEW YORK – The F.&M. Schaefer Brewing Co. has filed a suit against Electronic Data Systems Corp. (EDS) alleging gross and wanton negligence and breach of contract in a facilities management and software development agreement between the two firms.

Schaefer is seeking a total of $115 million, including $45 million in actual damages and $70 million in punitive damages.

The suit came as a complete surprise to EDS, according to a management statement, which added EDS was "unaware of any basis for the claims described by Schaefer."

From 1964 to 1968, Schaefer ran its own DP department with 24 employees and two leased IBM 360/30s. Coincident with a reorganization plan, the firm developed a five-year plan for DP to provide for growth and, in particular, for utilization of past sales histories in forecasting future sales and redesign of existing software for more efficient operation.

In January 1969, Schaefer hired EDS as an outside consultant to review, analyze and report on the DP plans and ongoing DP operations, according to the court brief.

Current Software Inflexible

EDS' report stated current software was inflexible and advised that the development of any new software, particularly for short-range forecasting, would require experts.

EDS, the brief said, undertook a detailed examination of Schaefer's present and future DP needs "without remuneration or contractual obligation."

This ended with the recommendation that Schaefer "should terminate or reassign all of its data processing employees and utilize an outside contractor such as EDS for its data processing needs."

It also claimed a short-range forecasting system could be developed and implemented by EDS within 12 months, the Schaefer brief stated.

The suit charged EDS' advice was negligent because it failed to provide for adequate applications knowledge of Schaefer's particular needs to remain resident during the period of development of the new system.

The brief further alleged that "the system EDS undertook to design . . . was improperly designed in that it failed to interrelate the subsystems of Schaefer and was poorly and inadequately documented, or not documented at all, and, in fact, was substantially a copy of the system previously used by Schaefer which EDS had stated was inadequate for planned future growth."

EDS also failed to set up a realistic implementation time schedule, the suit claimed.

As a prerequisite to any contract between EDS and Schaefer, Schaefer had to agree to turn over all of its existing

(Continued on Page 2)

Ford People Prepare For Campaign Trail With Automated Lists

By John P. Hebert
Of the CW Staff

WASHINGTON, D.C. The behind-the-scenes computer-room support work for President Ford's direct telephone campaign for the upcoming November election is about 95% completed.

The National Republican Congressional Committee (NRCC) has processed identification data on 35 million to 40 million voters by party registration. The list is current as of July, when this year's presidential primaries ended, according to Murray Dickman, director of the Computer Services Division of the NRCC.

Last week, NRCC had election results from primaries in 48 states representing results from about 150,000 precincts, Dickman said. (California is one of the two missing because of the late-year primary.)

Even though NRCC's Computer Services Division has no computer system it can call its own, the organization gathers in-

(Continued on Page 5)

Independents Protest FCC Call For Data on Bell Bill Lobbying

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – Independent telephone companies have launched vigorous objections to a request from the Federal Communications Commission (FCC) for data on lobbying efforts related to the Consumer Communications Reform Act of 1976.

The requirements "constitute a blatant abuse of authoritarian governmental power," according to the U.S. Independent Telephone Association (Usita).

The FCC's request for financial data on lobbying efforts "tends to intimidate the recipient companies and tends to infer to all companies that the FCC believes legal and legitimate political action is wrong and improper," Usita said.

"This is purely and simply a fishing expedition," Usita wrote in comments sent to the General Accounting Office (GAO) about the FCC request.

In June, the FCC initiated efforts to require an accounting of funds being spent by the telephone industry in support of the Bell-fostered Reform Act, now pending before Congress.

One of the affected phone companies appealed to the GAO for a review of the accounting and reporting details being requested by the FCC. As a result, no lobbying data has yet been provided to the FCC.

The GAO entered the picture under terms of the Federal Reports Act, which allows it to approve conditions set up to report financial information by companies to regulatory agencies.

The act allows the GAO to determine only that the reporting procedures do not establish an unnecessary burden on the regulated companies, but it does not empower the office to rule on the need for the information, a GAO spokesman said. The FCC determines whether the information is needed, he added.

Despite this limitation, Usita has told the GAO its members strongly oppose the

(Continued on Page 4)

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Schaefer Asks $115 Million From EDS For Negligence and Breach of Contract

(Continued from Page 1)

software and documentation, its data base and full control of its DP system, the brief alleged.

The firm also agreed to be deprived of access to the documentation, systems design and any other material developed by EDS during the development process and for seven years thereafter.

Under the terms of the May 1969 contract, Schaefer agreed to pay EDS $67,309/mo to run the then-current DP system and $112,500/mo to run the new system once developed, as well as $3.5 million amortized over 84 months for the development and continuing right to use the new system.

By April 1970, some 36 EDS employees were situated full-time at Schaefer, running the existing DP operation and programming the new one. During May of that year, they tested a short-range forecasting subsystem, the brief claimed.

Implementation of the subsystem revealed "inaccurate information being produced in that forecasted sales figures for customers were neither supported by past histories nor by subsequent results achieved," Schaefer's filing charged.

EDS said the inaccuracies were due to incomplete implementation, the suit claimed.

From January 1971 through July 1972, EDS implemented seven subsystems including personnel, distribution, load-balancing, production planning, sales reporting, order entry and budgeting.

Inadequate Systems Development

The systems development was inadequate because there was inadequate editing, inadequate or no controls, inadequate or no documentation and inadequate testing prior to implementation with a resulting destruction of accuracy of the data base, the suit charged.

During that same period and thereafter, EDS "fraudulently concealed the deficiencies and inaccuracies" of the systems, the suit claimed.

"Furthermore, due to the terms and conditions [of the contract], Schaefer was precluded from discovering such deficiencies and inaccuracies," Schaefer said.

In December 1972, EDS claimed that "Phase I – Preinstallation" was completed and all subsystems were programmed and operational, it continued.

The suit also alleged that from April 1970 through August 1974, on different occasions, "EDS fraudulently concealed the inadequacy and inaccuracy of its software . . . by knowingly failing to disclose or misstating the true facts to Schaefer with the intent and purpose of inducing Schaefer to continue in its contractual relationships with EDS."

EDS created falsified "control figures" to hide the fact that the system, if operated, did not balance and produced discrepancies, the brief claimed.

Various Discrepancies

As a result of misrepresentations, Schaefer said, it suffered from numerous DP problems including incorrect W-2 forms, an unbalanced operating budget, erroneous invoices and customer statements, a 1972 payroll understated by $1.8 million, overtime overstated by $6 million and incorrectly updated accounts payable files.

These and "various other discrepancies, inaccuracies and misleading information were produced by the computer system, which made it difficult for Schaefer to remain in business," the suit claimed.

In May 1974, EDS and Schaefer began discussions concerning the termination of their contract and, in December of that year, Schaefer informed EDS of its intent to terminate at the earliest possible time because of unsatisfactory results on EDS' part.

In May 1975, EDS began partial delivery of various documents, flowcharts and program listings to Schaefer. Deliveries were to continue until Aug. 28, 1976.

During August 1975, Schaefer personnel, in attempting to utilize the programs and subsystems delivered by EDS, discovered the subsystems were inadequate, poorly documented, inadequately tested "and were materially deficient in all respects," the brief stated.

Schaefer further discovered EDS had been maintaining a report since 1971 which indicated that amounts of goods sold under the load-balance subsystem did not equal the amounts shown on the order entry subsystem. These discrepancies had occurred on a daily basis since initial operation of the subsystem in 1971, the suit claimed.

Similar discrepancies were discovered in the financial system, Schaefer said.

Schaefer suffered damage in delay in creating a functioning and accurate system, thereby rendering the firm unable to market its goods, gain new customers and gain the benefit of decreased overhead and increased efficiency, the suit alleged.

The suit asked for the return of all monies paid to EDS. In addition, it seeks $8 million in order to enable Schaefer to create a new DP system; $1.9 million in cost of transition from the EDS system to Schaefer's own DP department; and $1 million for excess operating time during the period of transition (while the EDS system has to be operated with double checks and redundancy).

EDS, which claimed it first learned of the suit through a press release issued by Schaefer, said it "views the filing of the litigation as a tactic to attempt to avoid the payment to [EDS] of an amount exceeding $1.2 million owed [EDS] by Schaefer."

EDS plans to assert its own claims against Schaefer "in an effort to collect all amounts owed [EDS] by Schaefer."

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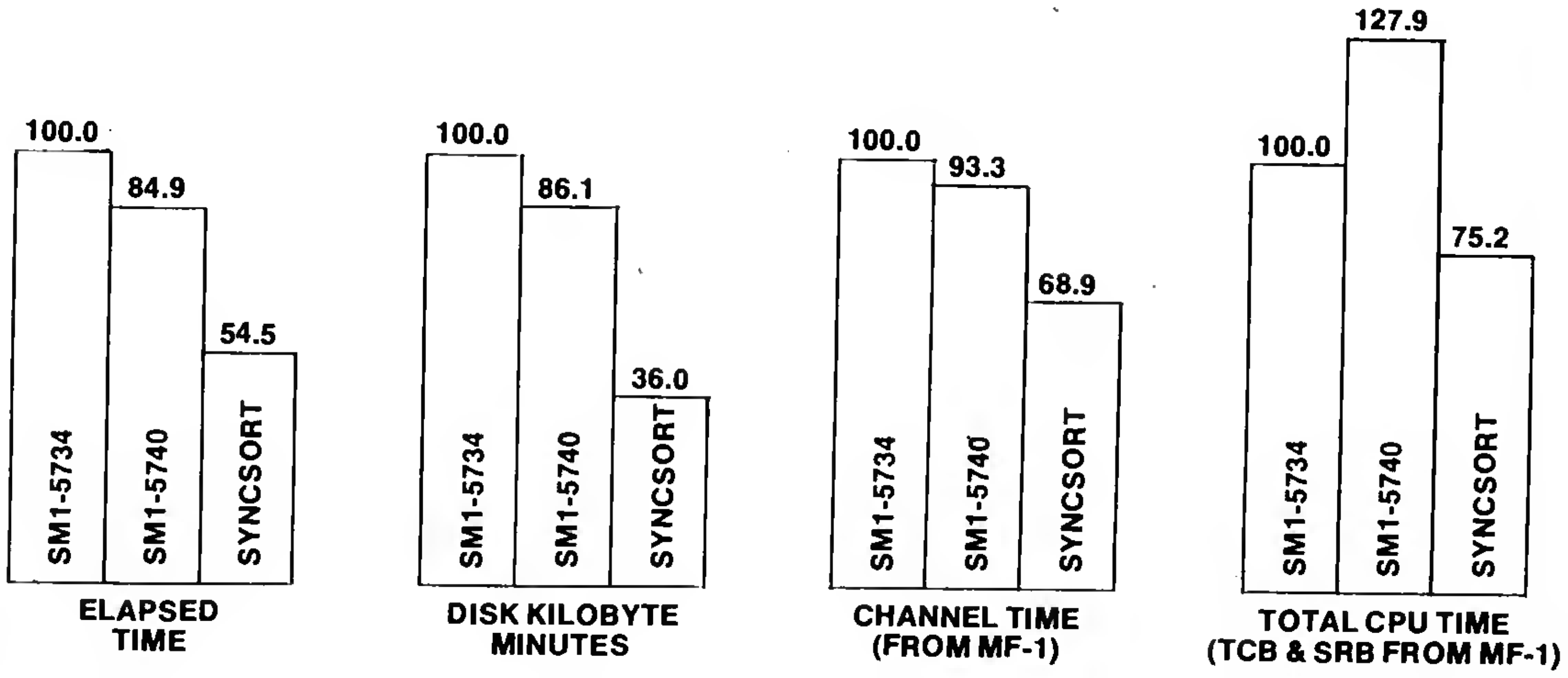

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Should IBM be discouraged? Not in the least. The difficulty is that the computer giant is competing in the wrong events. Maybe he ought to stick to events where weight and muscle are prime requisites for success. The hardware throw, for example.

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Six Charged With Altering TRW Credit Files for Fee

(Continued from Page 1)

which would cause false data to be entered," Keer said the indictment charged.

The whole operation, he said, did "not take a great deal of intelligence" in order to be successful and showed any system has "weak points."

The men in the ring charged anywhere from several hundred dollars up to $1,500 for the service, the indictment said. Bennett reportedly received $50 for each alteration.

The prosecutor said it was hard to get cooperation from people who had used the ring to change their credit ratings since all those people were technically in violation of the law also.

The prosecutors therefore settled for the 16 cases where they felt they had a good case, instead of checking the over 100 cases in which TRW warned banks and others there might be a possibility of fraud.

The prosecutors could not estimate how much credit might have been granted to people who had used the ring to get their records changed, but "we entered the case early enough to cut off a lot of losses," Keer said.

Other sources, however, estimated the losses at up to $1 million.

The indictments cover actions during the period from Aug. 1, 1974 to March 29, 1975.

Just a Local Matter

TRW tried to play down the whole case last week; a spokesman claimed it was just a local matter since all the people involved were Californians, even though they were indicted on federal charges.

In addition, he said "our security procedures have always been, we believe, excellent and effective. The kind of thing that occurred a year and a half ago has long been corrected and could not reoccur."

He declined, however, to give details of any new security arrangements.

Both the federal investigators and TRW noted the firm had cooperated fully with the investigation, even though the company did not bring the alleged fraud to the attention of the investigators.

The six men named in the indictment – Philip and Paul Kostoff, John R. Dubos, Kenneth Stevens, Ronald Rossi and Sean Shanahan – are scheduled to go on trial here Sept. 28, but there is a strong possibility their lawyers will ask for a delay before that time, according to court sources.

They were charged with conspiracy and making false statements in loan applications.

TRW's credit services are operated with the aid of two IBM 370/158s, a 370/155, about 380 Datapoint terminals, 2,000 teleprinters and 100 Raytheon CRTs.

FTC Investigating TRW Security

(Continued from Page 1)

firmed that 33% of the inquiries still call for a record to be updated to some extent. At present, he added, 2% of the reports issued by TRW are challenged.

Regarding the FTC investigation, the TRW spokesman said "this is a nonpublic investigation and we believe it should remain nonpublic as it was intended to be.

"To us it's not unusual to have the FTC conducting this type of investigation. It is chartered to enforce the Fair Credit Reporting Act, and it's just doing business as normal as far as we're concerned," he added.

"We don't believe the investigation is going to lead to any significant results. As far as we're concerned, we're in full compliance with the law. Our measures and our standards have been the highest in the industry . . . We've always gone beyond the letter of the law in operating policies and procedures," he said.

While the TRW spokesman saw nothing unusual in the FTC investigation, others in the firm apparently have, since it has reportedly filed a motion with the commission to quash a subpoena issued by the FTC for its records.

The firm reportedly said some of the FTC demands violated confidentiality, are not relevant and are burdensome.

If the FTC finds TRW does not take reasonable precautions in protecting the accuracy of credit data, it could find the firm in noncompliance with the Fair Credit Reporting Act and order it to implement new methods to ensure accuracy.

Independents Protest FCC Request for Data

(Continued from Page 1)

FCC financial requirements.

The FCC staff said it had received inquiries from members of Congress about the amount of money being spent by the telephone industry in supporting the Reform Act, Usita told the GAO.

"Conducting a survey of this type merely to respond to a congressman's curiosity or anticipating congressional committee requests does not appear to serve a justifiable governmental or FCC need," Usita said.

The FCC request will place a burden on the independent phone companies to set up additional accounting procedures, the association said. "There is neither time nor any reasonable way for this association to determine on a company-by-company basis the additional man-hours and expenses required to meet the FCC instructions," Usita said.

"The FCC is causing exactly what it claims it is trying to prevent – additional costs to the ratepayer," the letter said.

An AT&T spokesman said the Bell companies basically intended to comply with the FCC request for quarterly accounting information on Reform Act lobbying.

The Usita reference to requests for information from congressional committees may be related to Reform Act hearings scheduled to start this month before the House Subcommittee on Communications.

Among organizations scheduled to appear at the hearings are Tymshare, the Independent Data Communications Manufacturers Association, Service Bureau Corp. and the time-sharing section of the Association of Data Processing Service Organizations.

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DP Work Now 95% Completed

Ford People Readying Campaign With Automated Lists

(Continued from Page 1)

formation for three data bases, updates them regularly and makes the information available to all Republicans running for office, Dickman said.

The "unbelievable data collection job," directed from NRCC headquarters here by an 11-person team, is a year-round event. The computer end of the business of getting Republicans elected is, however, really a seasonal job, Dickman remarked.

Most of the work is done in June, July and August, he said, adding that is the time of year when everybody at NRCC screams and yells, whether things are going all right or not.

Name and Number Correlation

For instance, in the last two weeks of August, 20 million voters' names were matched with telephone lists with the help of an IBM 370/158, a 370/165 and 10 IBM 1403 printers working around the clock at the large Midwestern computer services bureau which NRCC uses for large-scale processing.

But that operation is really only one-third of the entire computer effort, Dickman said, adding it is where most of the $750,000 budgeted to the division is spent.

There is also a local firm from which NRCC buys computer time, he explained. Here, NRCC uses its own staff to execute NRCC-written programs on the firm's IBM 360/50 in preparation for the runs.

A third firm handles the intermediary work of standardizing information gathered through the organization's data collection effort, Dickman said. Although it is a small firm with a small machine – an IBM 360/40 – its employees have political experience, understand the tapes NRCC gives them and know how to format the data.

In addition to the political aspects, NRCC has its own Microdata Corp. Reality minicomputer which it primarily uses for administrative purposes like bill paying, Dickman said.

National Telephone List

NRCC obtains a national telephone list with 53 million phone numbers and names to compile the voter registration lists. There are three different direct-mail companies which sell the lists and updates to them, he noted.

NRCC voter registration lists come from larger counties in each of the 50 states, Dickman said. The lists are usually on cards and tapes, but they are all formatted differently.

Since there are no standards for the information coming in from about 400 separate sources, the 360/40 is needed to correlate voters' names with their telephone numbers, he said.

"And, when dealing with 35 million to 40 million names and 53 million telephone numbers, we will have incomplete information," he added. In these cases, NRCC attempts to complete the information only for larger counties.

When the information is standardized and processed, it is placed on computer printouts, or "walking lists," he noted.

The walking lists are the final form for the information stored on NRCC's three data bases which can be used by campaign workers to identify voters.

When the campaign workers place a phone call to one of the 53 million on the list, they ask the person which candidate will get his vote. If the answer is "Gerry Ford," the worker will try to get him to donate either time or money to help with the direct telephone campaign, Dickman said.

NRCC hopes to make 43 million telephone calls before the November presidential election to "develop a list of favorable Republican voters" as long as possible before the election, he explained.

After the election, NRCC will update the list by hiring a huge keypunch operation, he said.

"The advantage of the NRCC operation is that it is an information clearinghouse for Republicans running for public office. It eliminates all duplication of efforts because the Republicans can come to us for the information they need," Dickman explained.

The role of the Computer Services Division is to help the candidates by supplying very basic information, such as where the heavy concentrations of Republicans reside, he said.

Dickman called the operation "more successful than the Democrats' operation because it has been done much longer" – this being the tenth year.

NRCC raises money privately, with about 95% of the $9 million taken in this year coming from 750,000 small contributors who donate $25 or less, he noted.

This money is the bulk of the support for NRCC's 210 salaried employees at the headquarters near Capitol Hill, he said.

38% of Candidates Pass 1976 CDP Exam

CHICAGO – Almost 38%, or 929, of the DPers who sat for this year's Certificate in Data Processing (CDP) examination successfully completed the test, according to Fred Harris.

Harris is president of the Institute for Certification of Computer Professionals, which administers the test.

The 38% figure was a four-year high, Harris noted, and was an indication "the individuals taking the test have a much broader scope of knowledge and sophistication in the computer arts and relevant information" than previously because "the exam isn't getting easier."

The ICCP will make a cash award of $500 to the person who took the test for the first time and achieved the highest score.

"Awards for Excellence," consisting of a certificate and CDP key, have been given to those scoring highest in each of the exam's five sections (See story on Page 14).

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MRI Head Cites Document Demands

Justice Witness Charges IBM Abused Legal Process

By Edith Holmes
Of the CW Staff

AUSTIN, Texas – A large, well-heeled company like IBM can distort the legal process, according to Robert L. Brueck, president of MRI Systems Corp. and a recent witness in the trial of the U.S. government's antitrust case against IBM.

And, in Brueck's opinion, IBM not only can, but has abused that process in U.S. vs. IBM.

MRI, a software and consulting firm here known particularly for its data base management system, System 2000, is one of many companies involved in this litigation on behalf of the government or IBM as a nonparty.

Slated to be a witness for the Justice Department in the "bundling" or single pricing aspect of its suit against the corporation, Brueck – and MRI – were subpoenaed last December to produce various files to the attorneys for the defense.

IBM's need for these files and the documents in them was "overstated," the MRI president said. Harassment by IBM has occurred because the document demands appeared "well calculated to burden our company with considerable expense, including tying up management time," he added.

Brueck noted he couldn't say anything about IBM's intent in levying such an extensive subpoena on MRI. He didn't know whether IBM counsel was just trying to do the best it could for its client or if its client has an interest in MRI beyond this suit which it plans to further through the case.

At the same time, he stated, "I firmly believe the parties are working in the system – professionally for the most part – to perform their particular roles."

But any time a corporation is as large and as financially well-off as IBM is, there is potential for misuse of that position, Brueck added.

If a company is big enough, it can justify spending large amounts of money for a case like this; it can offer aggressive, talented legal counsel and an almost unlimited budget with which to try to win the suit, he said.

"It remains to be seen whether MRI lost anything by permitting IBM counsel to look at the documents," Brueck stated. "If we catch any of those people allowed access to the MRI documents violating the specifications of the protective order [established by the federal district court hearing the antitrust trial in New York City], we will prosecute vigorously and to the fullest extent of the law.

"If those with access to these materials are smart, they will take the rules and protections governing them very seriously," he continued. If there are any leaks, he said he might run a big ad offering a reward for information leading to their origins.

Stalling Tactics

While the MRI documents were subpoenaed by IBM at the end of December, the Texas company didn't begin producing its files until it was ordered to do so late in the spring by Judge David N. Edelstein, who is presiding over the trial.

Production wasn't completed until June and Brueck didn't take the stand until mid-July.

MRI went through its own legal maneuvers to delay the IBM discovery as long as possible, beginning by first appealing the subpoena to the U.S. District Court for the Western District of Texas. Brueck and MRI later asked Edelstein to quash the subpoena, but the judge denied this request.

Brueck contends the time taken in the months between the time the subpoena was first filed and the date he actually took the stand was necessary to establish the rights of the parties involved.

In addition, MRI needed time to produce the documents, he said. Thousands of files had to be reviewed by MRI as part of its legal duty as the subpoenaed party; several hundreds of thousands of pages of documents were produced and these were copied by IBM, Brueck stated.

Few Documents Entered

In the end, very few of these documents were actually entered into evidence. MRI's counsel was in the courtroom for the better part of Brueck's testimony, and the company president credited much of MRI's ability to protect its confidential documents to the work of its outside attorneys.

Based on his experience in court, Brueck said he thinks judges responsible for cases of this kind need some form of special assistance to resolve procedural problems like those that came up with the documents in his testimony. Whatever form that special help takes, he added, "it should hold weight in the law."

The federal rules governing civil cases like U.S. vs. IBM could be augmented to provide support for the trial judge that would benefit the parties and the nonparties involved as well as the court, Brueck added.

Md., Va. HIS Users Form Group for H66/6000 Sites

BALTIMORE – Twelve large systems users in Maryland and Virginia have formed the Mid-Atlantic H66/6000 Users Group for users of that Honeywell Information Systems (HIS) computer series.

The group plans to meet five times a year. Each meeting will feature three technical presentations and an informal round-table discussion, according to Gerald M. Bull, corresponding secretary of the group.

Channels to Vendor

Besides serving as a communications channel for the members of the group, "we intend to make communications with both HIS and the National Honeywell Large System Users Association more effective," Bull said.

Additional information is available from Bull at Peterson, Howell & Heather, Inc., P.O. Box 2174, Baltimore, Md. 21203.

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VA Says Target System Meets Privacy Act Demands

By a CW Staff Writer

WASHINGTON, D.C. – With security one of its priorities, the Veterans Administration (VA) is developing a data base-oriented system called Target to automate the claims-processing activities of its Compensation, Pension and Education Program.

The system, which has received criticism from privacy proponents, meets the requirements of the Privacy Act of 1974, the VA said.

"The focus of Target security is based in large measure on procedural and applications software development provided by the VA," the agency said, so the vendors are not being asked to provide a turnkey security system.

With the system, local regional offices will be able to manipulate, store and retrieve live claims file data and to immediately exchange and modify this data through communications with other files containing original source data or master record information, the VA said.

The system will maintain a work-in-process file with automatic follow-up features, allow on-line award processing, provide quick answers to inquiries on benefit claims and exercise greater control over accounts receivables, appropriation accounting and audit functions, the agency said.

The system should reduce claims development time and get initial benefit checks to veterans faster, the VA said. The agency expects to save millions of dollars annually by eliminating the present off-line batch input function and its related payroll.

Target will connect regional and central files as well as access information from the Beneficiary Index and Records Locator files, the VA said.

The system is envisioned functioning on a regional basis, with multiprocessors in three regional DP centers supporting intelligent terminals in 56 regional offices.

There will also be a Target Central System for data base maintenance, as well as centralized reporting and accounting functions and a computerized index of beneficiary information.

The Target Central System and the first regional DP center are scheduled to be operational by December 1977, with the other centers up by mid-July and October 1978.

Before issuing requests for proposals (RFP), the agency incorporated into its specifications several features discovered useful during pilot projects in Philadelphia, Baltimore, New York, Washington and Los Angeles.

Passwords and Badges

The vendors will supply interconnections to the VA software with their operating system, data base management system and transaction-processing system, the VA said.

"This will facilitate checking of the personal passwords and magnetic badge passwords originating at the regional office for authorization to use commands and data base records related to personal data," the agency stated.

The VA is investigating the need for encryption of data. It has asked the General Services Administration for authorization to procure data encryption devices to be installed should this be necessary,

In addition to specific security measures, the system will include several that are applicable to any area where security may be a factor, the VA said. These include:

- Taking audit trails on every data base update.
- Performing spot audits both of files and the original letters.
- Randomly selecting cases for quality review.
- Reviewing reports from the work-in-process subsystem for discrepancies.
- Reminding users that security measures are in effect and violators will be dealt with in the appropriate manner.

Varying according to the specifics of the data being handled, security measures will include encoding data, restricted commands for master updates, violations logs and elimination of unnecessary reports.

Terminal Precautions

Security against unauthorized use will include several controls aimed at the terminal user. An internal security code unknown to the user will control access, the VA said.

In addition, access to sensitive files will require special authorization. Operator passwords will be changed, violations reviewed by security officers and log-ins made of inquiries to the sensitive file as well as of updates to the security file.

There will also be precautions designed to limit programmers' access. Source modules will have unique passwords, and highly sensitive modules will be protected by a management code.

In addition, supervisory authority will be required through the regional DP center console operator to replace a module, and special audits of codes will be performed on highly sensitive modules.

Auditors, whose access will be controlled by security officers, will read code of sensitive modules.

Practicing What They Preach

ATLANTA – In an effort to practice what they preach, the higher-ups of the Urban and Regional Information Systems Association (Urisa) had an on-site computerized registration and information system to make their lives easier at Urisa's conference here recently.

The system, which ran on-line to an IBM 5100, was touted as the "first portable computerized registration system to date for small conferences."

Karen Meals, assistant executive director of Atlanta-based American Institute for Decision Sciences (Aids), said the system allowed a conference to come on-scene to a city where temporary employees were unfamiliar with registration data procedures.

The functions of the system used by Urisa included an alphabetical listing of registrants, identification of members' hotel accommodations (in order to reach them if necessary) and cross-reference listings to verify attendance and bill-paid status, Meals said.

Cassette cartridges held all the data on the 5100 system. A booklet of proceedings and receipts for attendees were printed on an IBM 5103 printer.

The system in use at Urisa had a capacity for data on 1,200 attendees – more than enough power to process data on the 643 who showed up – and Aids/Urisa could have expanded that capability with an additional disk, Meals said.

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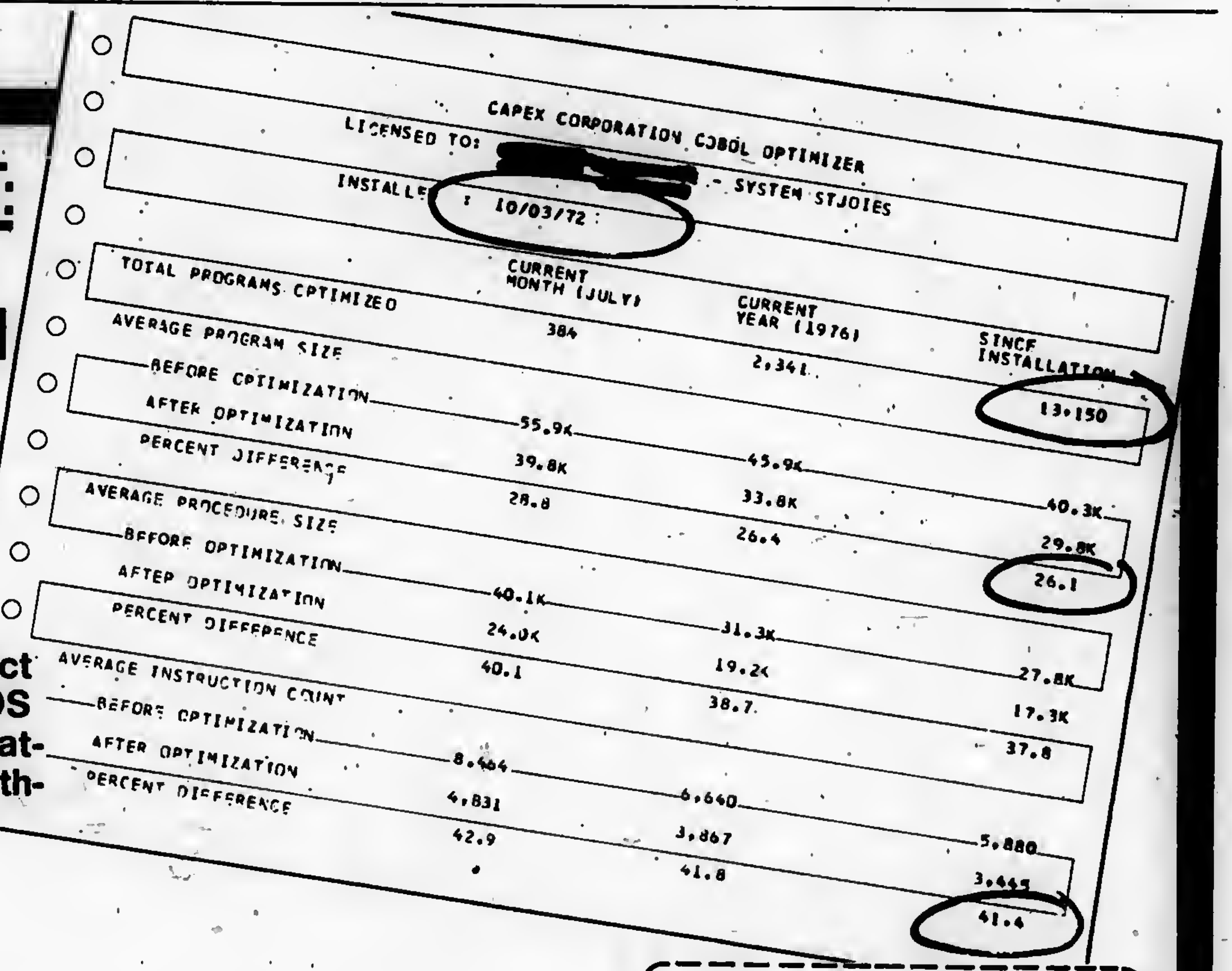

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CAPEX CORPORATION COBOL OPTIMIZER
LICENSED TO: [redacted] - SYSTEM STJOIES
INSTALLE : 10/03/72 :
                                CURRENT         CURRENT        SINCE
                                MONTH (JULY)    YEAR (1976)    INSTALLATION
TOTAL PROGRAMS OPTIMIZED        384             2,341          13,150
AVERAGE PROGRAM SIZE
  BEFORE OPTIMIZATION           55.9K           45.9K          40.3K
  AFTER OPTIMIZATION            39.8K           33.8K          29.8K
  PERCENT DIFFERENCE            28.8            26.4           26.1
AVERAGE PROCEDURE SIZE
  BEFORE OPTIMIZATION           40.1K           31.3K          27.8K
  AFTER OPTIMIZATION            24.0K           19.2K          17.3K
  PERCENT DIFFERENCE            40.1            38.7           37.8
AVERAGE INSTRUCTION COUNT
  BEFORE OPTIMIZATION           8,464           6,640          5,880
  AFTER OPTIMIZATION            4,831           3,867          3,445
  PERCENT DIFFERENCE            42.9            41.8           41.4
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Two Sides Presented on Citizen Information Systems

By John P. Hebert
Of the CW Staff

ATLANTA – Should computers be used in citizen information systems?

That question was asked of persons attending the Urban and Regional Information Systems Association (Urisa '76) conference by a five-man panel of educators and legislators, here recently.

At a Urisa session entitled "Information Systems as Services to Citizens" some on the panel sided with the argument for increased use and some argued against, but all of them asked attendees to think about the effects – good and bad – of using computerized information systems.

"Information systems are all around us, but there is poor utilization now," William Hanna, mayor of Rockville, Md., told attendees.

"All ideas for 'systems' are feasible," he continued, "but do we want to do it? Do we want to pay for it? Technology has to be used and technology is not cheap," Hanna said.

"For [computerized] information services now and in the future what the citizen will get and what he will pay for it will have to be evaluated in terms of what the system is worth to him," Hanna remarked.

Projecting the knowledge of each other's business and lives as the probable end result of widespread use of computerized information systems, Hanna said. "I don't think everybody wants to be involved in everything and, therefore, sophisticated information systems are not a necessity."

In the realm of recreation and public works, for instance, the present systems do a pretty good job and there isn't a need for information systems to any great extent, he added.

"Let's look ahead to something that is going to be needed and not an unnecessary waste of energy."

Argument Reinforced

Nathan Grundstein, professor of management at Case Western Reserve University in Cleveland brought the necessary reinforcements to Hanna's argument for exercising caution.

"First, other decision structures exist. Secondly, other information structures already exist," Grundstein said.

"Don't think if you don't have the hardware with some guy tapping [public information] out that you don't have a system," Grundstein reminded attendees.

A different reaction to computerized information systems came from Myron Weiner of the Institute of Public Service at the University of Connecticut.

"We should be able to use information systems from our home or office," Weiner said arguing for public computer usage.

"An average of only 8% of the city or town budget is presently devoted to the use of computers. But when people realize that computers are for them and not for [bureaucrats], the percentage of allocation will increase," Weiner predicted.

The public should be able to use information systems from their own computer terminals for their own purposes, he continued.

"We have a responsibility to the citizen. The impact of what we do as information systems specialists must be gauged by the effect on people's lives," Weiner said.

Although Weiner may have come off as an information system enthusiast, he did caution the assemblage on the timing of implementing such systems.

Voicing his concerns, Weiner advised conferees not to "play the concept into blue skies" and to be well aware of the costs such systems would incur on the taxpaying public.

'Unstructured Interaction'

Taking a similar tack, Bill Manuel from Digital Equipment Corp. cautioned attendees not to build information systems that only benefit planners.

"The way we need to go is to work with the DPers and vendors. We need an unstructured type of interaction," Manuel said.

"At this point in time, everybody wants to go in different directions. We need tools to effectively and easily provide structures to get information to citizens for whatever purposes they need," he said.

The need for computerized information systems was echoed by Robert Koepsel, a city councilman in Rapid City, S.D.

"Nobody quarrels about the need [for such systems]," he said, "but we are so mired in need that we can't get the systems built."

Department heads are oftentimes the adversaries of plans for the use of the information systems, as are people's fears of computer systems, he said.

Robert Aangeenbrug, Urisa president and conference chairman, summarized the present computerized information system when he said "communication is intuitive at this point. We need to bring our ideas out into the open."

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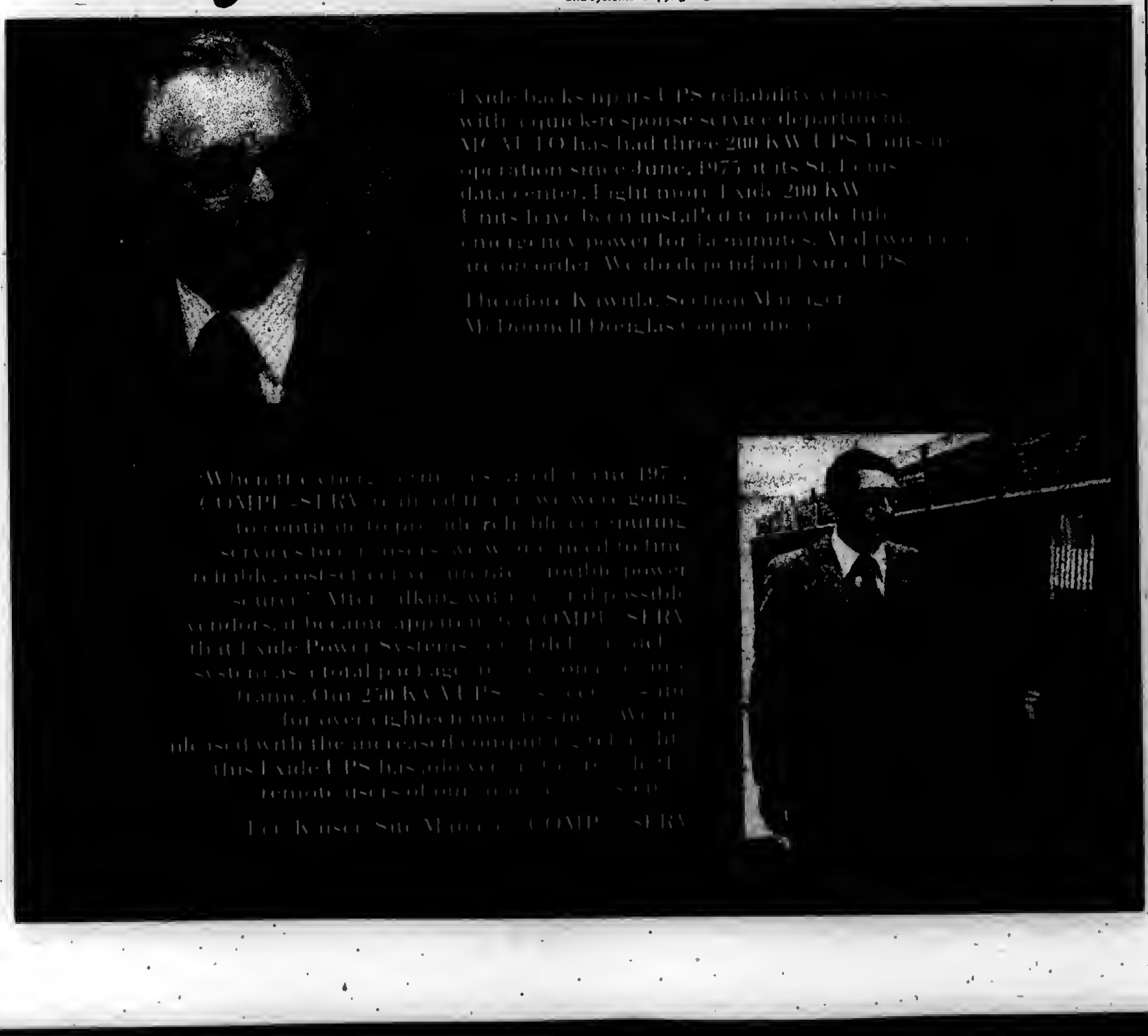

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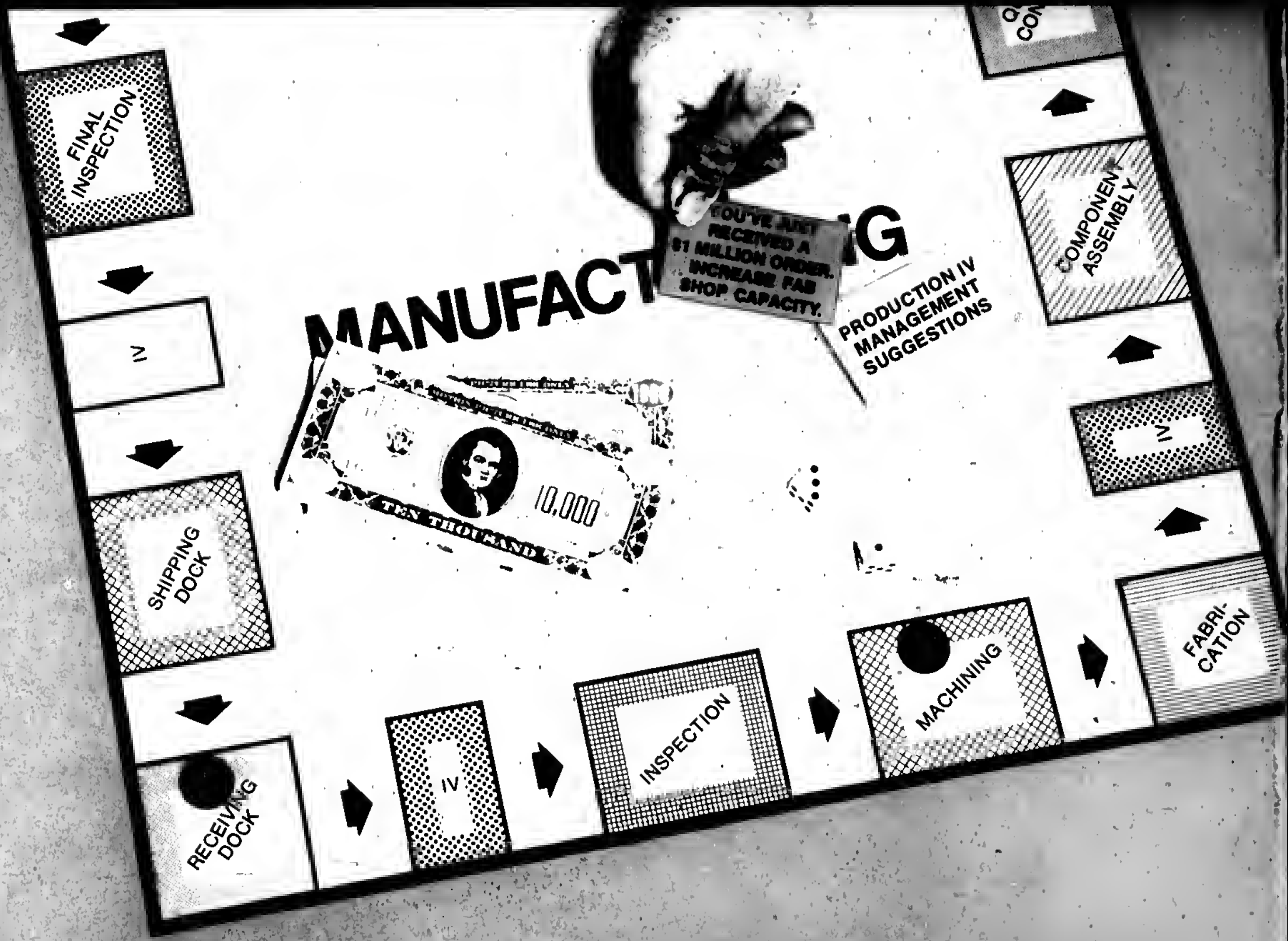

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Marketing Professor Says

Psychological Reasons Hindering EFT Acceptance

ATLANTA – Electronic funds transfer (EFT) systems are not about to sweep the nation overnight. EFT is, in fact, being accepted by consumers more slowly than many have predicted, according to Leonard L. Berry, chairman of the marketing department at Georgia State University.

The phrase "checkless society," he suggested, should be replaced with "less check" society.

In an article in *Banking Magazine*, Berry cited several examples to illustrate the slow progress EFT has made and the psychological reasons why.

An Arthur D. Little study, for example, projects that even when fully developed, EFT systems will probably never replace more than about 70% of paper-based transfers. And, at the end of 1975, the average monthly number of transactions on automatic teller machines (ATMs) and cash-dispensers was only approximately 1,800.

Verne Atwater, a member of the Commission on Electronic Funds Transfers, has stated that "in the case of automated teller machines there are few operations to date that have broken even financially. The volume of transactions is simply not sufficient to cover the cost," Berry noted.

Slow Diffusion

Berry attributes EFT's slow acceptance to a behavioral science theory known as diffusion theory, which concerns the adoption of an innovation, or in this case a new product, by its ultimate users.

Innovations fall into three categories: continuous innovations which have the least disrupting impact on established behavior patterns (such as flouride toothpaste); dynamically continuous innovations which are disruptive but do not materially alter established patterns (touch-tone phones); and discontinuous innovations which are characterized by a major behavioral change (commercial air travel), Berry said.

Electronic funds transfer services fall into the discontinous innovations category, Berry said, noting that this means their diffusion through society will tend to be slow.

"It should be noted that saying a specific new product will diffuse slowly is not the same thing as saying that the product will eventually be successful," Berry added.

A standard diffusion graph portrays the pattern of adoption for those users who do eventually adopt, but makes no mention of the total number of eventual adopters or nonadopters, he said.

Six Characteristics

Berry listed six characteristics which influence the speed and extent of an innovation's acceptance: relative advantage, compatibility, complexity, divisibility, communicability and cost.

Relative advantage, he said, "refers to the degree of superiority of the new product innovation relative to product alternatives it is designed to replace."

Color television and pocket calculators, for instance, have high relative advantage.

Compatibility matches the innovation to current values and behavior patterns, while complexity refers to the user's perception of the difficulty involved in using the innovation.

Compatibility and complexity "are the prime determinants of where on the 'continuous/discontinuous' continuum a product innovation will fall," Berry said.

Divisibility measures the extent to which an innovation may be tried on a limited basis, without requiring consumer commitment.

Communicability refers to the degree of difficulty with which the innovation's benefits can be communicated to the targeted user, while cost refers to the amount of his resources the user will have to expend to obtain the innovation.

ATMs rate poorly in terms of compatibility, complexity, communicability and, in many cases, relative advantage, Berry stated.

ATMs represent an abrupt departure from the consumer's traditional way of interfacing with a bank, he said. "The human teller is replaced by a machine, and the machine not only appears complex to work but, in fact, is complex to work," he said.

Low compatibility, high complexity and poor communicability are not enough to doom an innovation, however, Berry said.

But, with the addition of insufficient relative advantage, its chances are dismal.

"In the case of ATMs, it is doubtful that on-bank-premise, current generation equipment has sufficient relative advantage for enough consumers of most banks now involved in this type of service to allow an adequate return on investment to these banks," he said, noting that people would rather interact with human tellers when the bank is open.

"On the other hand, placing ATMs in strategic off-premise sites, such as an office building, may well provide enough additional convenience (relative advantage) to enough additional people to produce an acceptable market response and justify the bank's investment," Berry stated.

Point-of-sale (POS) terminals operated by store personnel require much less behavior change than ATMs since many people are already in the habit of cashing checks in retail stores "and already know how to hand over a piece of plastic to a merchant," he said.

This would place POS systems in the dynamically continuous innovation category, he added.

"In addition, POS systems rate well on the criterion of relative advantage both in terms of the convenience of fewer visits to the bank and the capability of using an interest-bearing account for routine transactions," he said.

"Benefits such as these should overshadow such drawbacks as loss of float for a great many consumers," Berry said.

"Also, POS systems, like ATMs, are relatively divisible in the sense that the consumer may experiment without feeling that he is necessarily making a permanent commitment," he noted.

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Government-Based Systems Seen Posing Big Threat to Citizens

ATLANTA – There could be disastrous spin-offs from the widespread use of government-based, computerized information systems, according to panelists at an Urban and Regional Information Systems (Urisa '76) session held here recently.

Nathan Grundstein, a professor of management at Case Western Reserve University, summarized common thoughts and fears at a question and answer period following a session on "Information Systems as Services to Citizens."

"I come from a stance of doubt," Grundstein told the Urisa members.

"The direction of electronic technology and the potentialities of the market is to take the whole communications structure – not information – and, through a generative process, bring it into the home and collective levels," he said.

"I have the feeling government will be chasing the citizen down the road to find out what he is doing," Grundstein said of the control government could have over public information dispersal.

"There has been much general talk about the need for information systems" here at the Urisa conference, noted William Hanna, mayor of Rockville, Md.

However, the questions surrounding computer-based, public information systems center around whether there will be "greater control or greater democracy and representation.

"Wherever the information will be stored, that's where the power lies. The completely equitable use of information is as hard as gathering information. There is a potential for abuse of the citizenry," Hanna remarked.

"But we are dealing not only with a problem of citizen fear [of government], but also with the abuse of power," Myron Weiner, a professor at the University of Connecticut's Institute of Public Service, argued.

Calling computer-based information systems a tool to do things faster and therefore a way to bring government and the people closer together, Weiner said "I am in business to help citizens deal with a very complex society."

And, as for the misuse of power and public fear, "the telephone is a very powerful information system tool, but I doubt the telephone changed the problem of abuse of power," Weiner said.

Grundstein noted the concept of constitutional liberty is a mystery and the development of citizen capability to access great amounts of information aided by computers in the home will not alleviate "a distrust of government that is sound," he concluded.

Commerce Gives IBM Nod To Sell 370/145 to USSR

ARMONK, N.Y. – The Commerce Department has finally approved the sale of an IBM system to Intourist, the Soviet Union's travel agency.

The system, based on a 370/145, includes eight 3330 disk drives and 140 Model 4505 terminals for use by reservations clerks. Its value is estimated at $5 million.

The Commerce Department had previously rejected IBM's bid to sell a 370/158 and a 370/145 and Model 3330 disk drives valued at $11 million.

States Busy With Privacy Laws

WASHINGTON, D.C. – While Congress appears to have taken a privacy breather, the states have been busy with legislation of all types.

The chart below tells the story. It is reprinted from *Compilation of State and Federal Laws on Privacy*, a 169-page book available for $10 from Privacy Journal, Box 8844, Washington, D.C. 20003.

	Medical	School	Wiretap	Polygraph	Arrest	Criminal Justice Information Systems	Social Security Number	Tax	Credit	Data Banks	Banks	Misc.
Alabama	X											
Alaska	X	X		X		X						
Arizona	X	X	X			X			X	P		
Arkansas	X					X	X			X		
California	X	X	X	X	X	X			X	PL	C	X XL
Colorado	X	X	X									
Connecticut	X	X	X	X	X				X			
Delaware	X	X	X	X	X							X
D.C.	X		X		X							
Florida	X	X	X		X				X L	P	C	
Georgia	X		X			X		X				X
Hawaii	X			X	X							X
Idaho	X	X		X		X					C	
Illinois	X	X			X					P		
Indiana	X									P		
Iowa	X	X				X					C	
Kansas	X		X						X			
Kentucky	X	X	X						X			
Louisiana	X		X		X	X						
Maine	X	X	X		X	X	X					
Maryland	X	X	X	X	X	X						
Massachusetts	X	X	X	X C	X	X	C	X	X	X		X
Michigan	X	X	X	X		X				P		
Minnesota	X	X	X	X		X		X		X		
Mississippi	X	X										
Missouri	X				X							
Montana	X	X								P		X
Nebraska	X	X	X									
Nevada	X		X									
New Hampshire	X		X									
New Jersey	X	X	X	X	X					P	C	
New Mexico	X		X			X			X			
New York	X	X	X		X				X	P		X
N. Carolina	X	X				X				L		
N. Dakota	X	X										
Ohio	X				X					X		
Oklahoma	X						X		X			X
Oregon	X	X	X	X	X							
Pennsylvania	X	X	X	X			C			P		
Rhode Island		X	X	X	X					P		
S. Carolina					X							
S. Dakota	X	X	X									
Tennessee	X	X			X							
Texas	X	X							X	L		
Utah	X				X	X				X		X
Vermont	X											
Virginia	X	X	X				X C	X	X	X		X
Washington	X	X		X	X	X				X		
W. Virginia	X				X							
Wisconsin	X	X	X					X				
Wyoming	X	X										
Federal Law		X	X		P	X	X	X	X	X	P	X

X = State Law on the Books.
P = Legislation Pending in State Legislature.
C = Significant Court Decision Affecting Privacy.
L = Local Ordinance Within the State.

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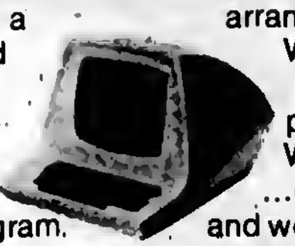

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Amdahl Picked DPMA Man of the Year

PARK RIDGE, Ill. – The Dats Processing Management Association (DPMA) has chosen Dr. Gene M. Amdahl, founder and chairman of the board of Amdahl Corp., as its 1976 Computer Sciences Man of the Year.

The annual award is given in recognition of outstanding contribution to the field of computer science, DPMA said. It will be presented during Info/Expo 76, DPMA's annual conference, on Oct. 27 in Las Vagas.

Amdahl began his career in information processing in 1952 with IBM, where he held positions as the chief designer for the 704, initial planner for the 709 and 7030 and manager of architecture for the 360.

In 1970, Amdahl founded his own company which manufactures the Amdahl 470V/6.

He has a PhD in theoretical physics from the University of Wisconsin and, while doing work on his doctorate, designed the first overlapped, floating point computer.

Amdahl is the holder of eight patents registered between 1959 and 1968 on such developments as recognition of recorded intelligence, analog-to-digital conversion, message display and transmission, stored logic computer, large scale shifter, memory protection system, storage protection system and the IBM System 360.

13 Win ICCP Awards

CHICAGO – Thirteen Certificates of Excellence for outstanding performance in the 1976 Certificate in Data Processing (CDP) examination have been awarded by the Institute for Certification of Computer Professionals (ICCP).

The highest score on the exam was achieved by Barry Berk, employed at the First Federal Savings and Loan here. In addition to achieving the highest total score, he also achieved highest honors in Principles of Management.

The other winners were Clinton Alston of Dallas, Texas, Chris Babcock of Chicago, Robert Brown of Atlanta, James Burns of Atlanta, Robert Camacho of Jacksonville, Fla., Richard Case of Yorktown Heights, N.Y., Howard Hensley of Skokie, Ill., Robert Ilderton of Memphis, Tenn., Malcolm Lewis of Pasadena, Calif., Thomas Mathews of Pasadena, Calif., Charles Rauch of New York and William Simmons of Montreal.

Call for Papers

1977 IEEE INTERNATIONAL SYMPOSIUM ON CIRCUITS ANO SYSTEMS, Phoenix, Ariz., April 25-27.

The symposium is devoted to all espects of the theory, design end epplicetions of circuits end systems. Pepers ere solicited in, but not restricted to, the areas of new concepts for the enelysis and design of circuits and systems, computer-eided techniques and new devices and circuits.

Four copies of eech paper should be submitted by Oct. 1 to T.N. Trick, Department of Electricel Engineering, University of Illinois, Urbane, Ill. 61801.

MICROCOMPUTER-77 CONFERENCE AND EXPOSITION, Oklehome City, Okle., April 6-8.

This conference concerns microcomputer systems, e survey of the renge of current epplications and exploration of potential areas for future development. The papers should include theory, implementation and epplicetions. Emphesis will be pleced on exhibits.

Abstracts should be submitted by Oct. 1 end finished pepers by Dec. 1 to Or. S.C. Lee, School of Electrical Engineering, University of Oklahoma, Norman, Okla. 73069.

1977 JOINT AUTOMATIC CONTROL CONFERENCE, San Francisco, June 22-24.

The theme of the conference is "Control Theory and Applications in the Service of Local Industry and includes both tutoriel state-of-the-ert and generel sessions. Areas covered will include system modeling and identification, self-organizing, learning end hierarchical, decision and control, pettern recognition and linguistic methods applied to lerge scale systems.

Abstrects should be sent to Or. Alex Levis, Assistent Progrem Chairmen, Systems Control Inc., 1801 Page Mill Rd., Palo Alto, Calif. 94304 by Nov. 1.

1977 ASSOCIATION FOR COMPUTING MACHINERY (ACM) COMPUTER SCIENCE CONFERENCE, Atlante, Jen. 31-Feb. 2.

The conference will feature short reports on current research in computer science by students, feculty and researchers in computer end information science. Abstrects of research reports should be submitted to Professor Vladimir Slamecka, Oirector, School of Information and Computer Science, Georgia Institute of Technology, Atlanta, Ga. 30332 by Nov. 15.

1977 NATIONAL COMPUTER CONFERENCE (NCC), Oellas, Texas, June 13-16.

Major emphesis will be placed on the following areas at the conference, although papers end session proposals on other topics ere welcome: the technology of computing, management and computing, the uses of computing, the individual end computing.

Previously unpublished pepers ere solicited. The material submitted should include six copies of the final peper, which should be e maximum of 5,000 words; six copies of e page containing a 150-word abstrect, the computing reviews classification end four to six key words descriptive of the content of the paper; end three copies of a short biography of the presentor of the paper.

Deadline for all submissions is Dec. 1. Papers should be sent to Dr. Robert R. Korfhage, Program Chairman, Dept. of Computer Science, Southern Methodist University, Dallas, Texas 75275.

NETWORKING THE TSP* SYSTEMS

When it comes to computer networks, MODCOMP offers you a big advantage.

Experience.

At MODCOMP, we were pioneers in making the concept of resource-sharing computer networks a practical reality. The tieing together of multiple computers in distributed processing systems whereby several computers work together, sharing the work load.

Putting the computing power out where the work is, yet allowing each computer in the network to do not only its own job, but also draw upon the resources of every other computer in the system.

We developed MAXNET as a standardized operating system exclusively for this purpose. And MODCOMP systems using our network software have been in operation for more than two years.

We now have over forty network systems in the field, with another fifteen or so being readied for early delivery. Which means that we have more experience—both in length of time and in numbers of systems installed—than all our competitors combined.

In addition to traditional "host-satellite" networks, we have systems in operation that include so-called "ring" networks, "star" networks, and many more. The important thing is that you can link your computers together in any format you want. Provide each computer with whatever peripherals are best suited to your purpose. And leave the rest to MAXNET.

We figure the best way to give you an idea of what MAXNET can do is to give you some examples showing how other people are now using it.

We invite you to study these case histories. More important, we invite you to get in touch with us so you can get a first-hand look at how well they work. Which is a lot more convincing than just listening to us brag about them.

Meanwhile, we have a couple of brochures you should send for.

Our MAXNET brochure deals with computer networking, and how MAXNET makes it all happen.

The other is a thirty-two page booklet that explains in detail exactly what we mean by MODCOMP "TSP." The Total Systems Performance that has made MODCOMP first choice of many of the world's toughest computer buyers.

If you're into computers at all, the TSP brochure is "must" reading. If you're into resource-sharing networks (and if you're not, you soon will be), the MAXNET brochure is equally compulsory.

Write Modular Computer Systems, 1650 West McNab Road, Ft. Lauderdale, FL 33309. Phone (305) 974-1380.

European Headquarters:
Export House, Woking,
Surrey, England
Phone (04862) 71471

Calendar

Sept. 17-18, Colorado Springs, Colo. – **"Managing the Legal Function,"** sponsored by the Association of Data Processing Service Organizations (Adapso). Contact: Adapso, 210 Summit Ave., Montvale, N.J. 07645.

Sept. 18, Denver – **1976 Mountain Region Computing Conference**, sponsored by the Association for Computing Machinery (ACM). Contact: Jeanne M. Tucker, Registration Chairwoman, '76 ACM Mountain Regional Computing Conference, 6900 Independence St., Arvada, Colo. 80004.

Sept. 20-21, Los Angeles – **Executive Seminar on the Impact of Privacy Legislation** sponsored by the Data Processing Management Association (DPMA). Contact: DPMA, 505 Busse Highway, Park Ridge, Ill. 60068.

Sept. 20-22, Denver – **Annual Data Processing Conference of the Super Market Institute** (SMI). Contact: SMI, 303 East Ohio, Chicago, Ill. 60611.

Sept. 20-22, Washington, D.C. – **Simulation and Simscript '76**, sponsored by CACI, Inc. Contact: J.S. Annino, CACI, 12011 San Vincente Blvd., Los Angeles, Calif. 90049.

Sept. 20-22, New York – **Seventh Annual Input/Output Seminar**, sponsored by the Input/Output Systems Association (IOSA). Contact: IOSA, 999 Bedford St., Stamford, Conn. 06905.

Sept. 22-24, Ottawa, Ont. – **APL 76 Conference**. Contact: Comshare Ltd., 304-11 Adelaide St., West, Toronto, Ont. M5H 1M2, Canada.

Societies/ User Groups

Professional Group Starts For Data Entry Managers

GREENWICH, Conn. – A professional organization has been formed to represent a large but unrepresented segment of the DP community – data entry managers.

The Data Entry Managers Association (Dema) was started in June by a group of people who participated in a seminar in data entry management. There are currently 60 members.

Dema was created to "promote the individual development of its members, to be a place for ideas to be exchanged, a forum for the education of the manager and his staff," according to Norman Bodek, president of Key Universal Ltd.

Further information is available from Bodek at Dema, 16E Weavers Hill, Greenwich, Conn. 06830.

Info to Include 10 Conferences

NEW YORK – Info 76 will consist of 10 separate "conferences-within-a-conference" when it is held in Chicago on Nov. 8-11.

Six of the small conferences will be devoted to the needs of those executives who are users of information while four will be addressed to those who develop the data.

The conference and accompanying exposition will help bridge the gap between end users and information managers, according to Clapp & Poliak, Inc., the conference sponsor.

The six end-user conferences will be for banks, industrial corporations, retail organizations, hospitals, insurance companies and financial officers.

Those for information managers will cover DP management, office systems, DP technology and mechanization of information systems in small organizations.

Further information is available from Clapp & Poliak at 245 Park Ave., New York, N.Y. 10017.

Two to Share Turing Award

NEW YORK – Michael O. Rabin of Hebrew University and Dana S. Scott of Oxford University have been chosen by the Association of Computing Machinery (ACM) to receive the A.M. Turing Award for 1976.

The award will be presented at ACM's annual conference Oct. 20-22 in Houston.

The annual award is given to members of ACM for technical contributions of great significance in computer science. Rabin and Scott were chosen for their contributions in the theory of computing, particularly for a joint paper they did that introduced the idea of nondeterministic machines.

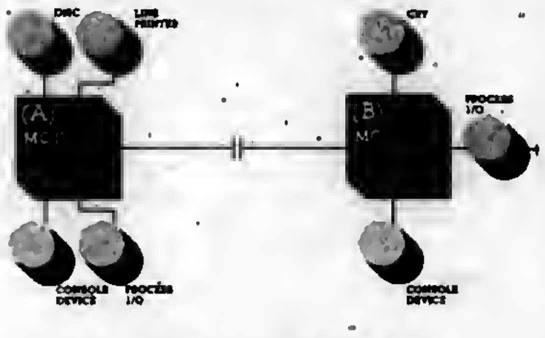
Rabin, a professor at Hebrew University in Jerusalem, has made contributions on complexity theory, tree automata and computations that are inherently exponential.

Scott, of the Mathematical Institute of Oxford University in England, is primarily a philosopher and logician but has contributed to computer science through his theory of computation, which has provided a model for the meaning of recursive computation.

Case History No. 1
A giant aluminum company chose MODCOMP for this simple two-computer "network."
Computer A is at one of the Company's plants in Pennsylvania. Computer B at a research facility in Tennessee, several hundred miles away. The two computers communicate with each other over ordinary dial-up telephone lines. Using MAXNET, operators at either location have full access to all the resources of both computers. Data, programs, peripheral services can be freely exchanged.

For example, suppose a research engineer at Computer B needs to compile a new program. By a simple terminal request, he can call down language processors from Computer A, compile and edit his program on his own computer, and transmit his listing outputs back to Computer A for printing.

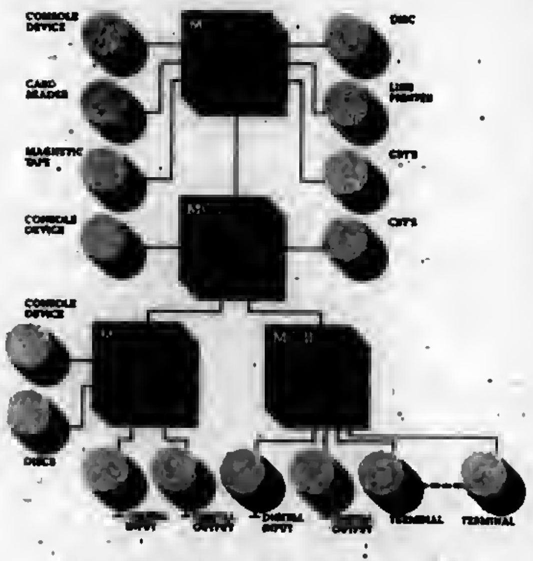
Alternatively, a programmer at Computer A can prepare a program and load it directly down to Computer B. Even though it's the break of day in Tennessee, and the computer is all alone in the office.



This relatively simple system illustrates the flexibility of MAXNET, whether the computers in your network are in adjoining rooms, or a thousand miles apart. It would work just as well if they were on different planets, but nobody's asked us to do that. Yet.

Case History No. 2
This MODCOMP Network is in operation at the central R&D facility of a major oil company. It's a good example of how MAXNET, coupled with across-the-board compatibility of MODCOMP hardware, allows you to start as small as you want to, and grow as big as you need to. Without a heavy initial investment. And without costly re-programming as your system expands.

It started, as part of a long-range plan, with the installation over two years ago of a MODCOMP III. Although this model has now been superseded in our line by later models of the MODCOMP II, it is indicative of the long-term compatibility of MODCOMP systems that the III remains today a vital part of this network.



As the system has since evolved, a 32-bit MODCOMP IV now acts as host computer. Replacing (at a fraction of the cost) the company's former stand alone IBM 1800, the MODCOMP IV is expected to provide 10 to 25 times the throughput of the big machine, which had long since reached its saturation point.

A MODCOMP II acts as communications controller between the host and satellite computers.

The satellites consist of 16-bit MODCOMP II's performing various data acquisition and control functions for a series of pilot plants. The MODCOMP III handles analytical instrumentation, providing simultaneous service to over 80 instruments of various types.

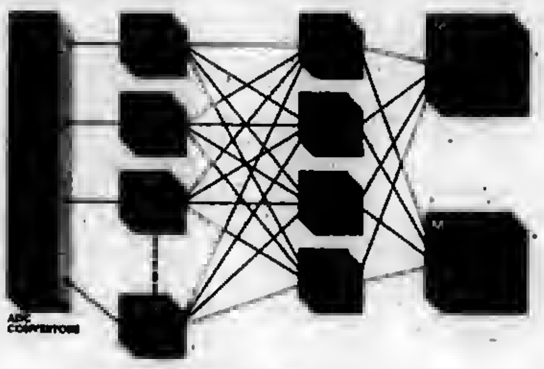
The advantages of this system are, firstly, it's computing power—many times that of the old stand-alone system. It's reliability (the MODCOMP system has had an overall availability of 99.3% of prime time over the past two years). It's expandability, which allows virtually unlimited future growth. And last, but far from least, it's economy and ease of operation.

Case History No. 3
A NASA prime contractor has installed this highly sophisticated MODCOMP hierarchical network to handle complex stress and fatigue test analyses.

Dual redundant 32-bit MODCOMP IV's at the "host" level communicate with an intermediate level of several smaller 32-bit MODCOMP IV's, screening data received from the satellite computers. A large number of 16-bit MODCOMP II satellites interface directly to the various processes. The entire system has built-in redundancy at each level.

Among minicomputer vendors, only MODCOMP has the capability to build a network of this size and complexity, using standard hardware and software products. At a small fraction of the cost for a single stand-alone computer large enough to perform the same multiple tasks. And with far greater efficiency.

It clearly illustrates the unlimited expandability of MAXNET in setting up any kind of network system you need to do your particular job.



For clarity, peripheral devices omitted from this diagram.

Note: The MAXNET systems shown here are all resource-sharing networks of the type commonly used in laboratory and industrial measurement and control systems. For dedicated telecommunications applications, MODCOMP offers a separate software system called MAXCOM. For more information, send for our Data Communications brochure.

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***TSP = Total Systems Performance.**

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CCH Developer Says System 'Hasn't Met Expectations'

By Nancy French

Of the CW Staff

JACKSON, Wyo. – The excitement and optimism that marked the beginning of computerized criminal history systems has been reduced to fingerpointing and name calling today, according to Bob Marx, a consultant who was one of the first systems people to study ways to bring automation to law enforcement.

The Federal Bureau of Investigation's (FBI) Computerized Criminal History (CCH) system has "not met our expectations for many reasons besides the present controversy over whether the FBI should control a message-switching system," Marx said. He was the technical affairs deputy for the original Project Search, which developed the CCH concept under federal contract.

"It's like the archduke who was assassinated in 1914 that supposedly caused World War I," he explained. "That assassination didn't cause World War I any more than message switching is responsible for the dissension" over the FBI's $600 million CCH program.

The FBI's proposed message-switching system would allow the FBI to return criminal records it is holding for nine participating states to their files and maintain only multistate and federal offenders.

Instead of obtaining records from the National Crime Information System (NCIC), states would then obtain them from the state were they are held via an automatic switching system controlled and maintained by the FBI.

Problems Outlined

The FBI's CCH system has many problems, Marx told attendees at the National Law Enforcement Telecommunication System's annual meeting here recently.

Disagreement over CCH policy has resulted in a battle between the Law Enforcement Assistance Administration (LEAA) and the FBI, he said, because LEAA's power to grant money, pass regulations and control system configuration by funding policy has threatened the traditional relationship between the FBI and local law enforcement.

Dissension between the FBI's 50-year old Identification Division, with responsibility over fingerprint-oriented files, and NCIC computer specialists who "displaced" it are another portion of the problem," he said.

Congressional disagreements are still another dimension of the problem, according to Marx. "Some people have suggested that a coalition of bleeding heart liberal congressmen and the American Civil Liberties Union on the one hand and the law enforcement community on the other hand is to blame," he said.

Marx, however, laid much of the blame on the law enforcement community itself.

"Our need for CCH has never been put forth in simple persuasive terms," he said. "We have said, 'We need it because we need it because we need it.'

"We have never said, 'This is why we need it, this is how much it is going to cost, this is what it is going to do, and this is what we can't do if we don't have it,'" Marx said.

Without message switching, the CCH system as it is presently configured as a centralized data base "will not work," he said.

Many disagree with the policy of maintaining CCH records at the federal level within easy access of federal agencies.

"About 16,000 inquires a day are addressed against the FBI identification files for federal noncriminal justice purposes in full compliance with federal laws. Many records, which would not have been permitted to be used for preemployment checks for civil servants in the states that created them, are open to federal agencies once included in the bigger file," he said.

Others say there is so much duplication in the system that state legislatures have been reluctant to create a file that would be built at great expense within a state and then shipped off to the federal level, where it is out of the state's control and where it will be used free of charge.

"It's easy to list problems," he said, "but the point is, where do we go from here?"

The FBI has been denied permission to develop the message switching portion of the CCH system and, as a result, Director Clarence Kelley has asked U.S. Attorney General Edward Levi for permission to end its participation in the CCH program.

If the Attorney General decides to deny this and instead gives the FBI message-switching authority, "it's not going to help very much because the other problems are still going to be there," Marx said.

Privacy Seminar Set On Impact of Laws

LOS ANGELES – A one and one half day executive seminar on the impact of privacy legislation will be sponsored by the Data Processing Management Association (DPMA) at the Marriott Hotel here on Sept. 20-21.

The seminar will give DPers an understanding of the problems encountered by private companies and federal and state agencies in complying with privacy legislation, according to George R. Eggert, DPMA international vice-president of program development.

Participating in the seminar as panel members will be industry and federal government representatives, including Edward J. Brennan Jr., general manager of TRW's Information Services Division, and Philip A.D. Schneider, associate director of the Bureau of Manpower Information.

Additional information is available from DPMA, 505 Busse Highway, Park Ridge, Ill. 60068.

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25th Anniversary WANG 1951 - 1976

For Multistate Offenders

CCH Designer Urges Alternative for Arrest Records

JACKSON, Wyo. – "The Federal Bureau of Investigation's [FBI] Computerized Criminal History system has so many problems we may have to start over again with a simpler system where the states can control their own destiny," Robert Marx told law enforcement telecommunications specialists at the National Law Enforcement Telecommunications Systems' (Nlets) annual meeting here recently.

"We should encourage gradualism – allowing states to join or not to join – regardless of their level of automation," he added.

Nlets is a state-supported and state-run nationwide law enforcement message-switching system.

Marx, who worked as deputy for technical affairs for Public Sytems, Inc., the federal contractor that developed the original Computerized Criminal History (CCH) system concept eight years ago under a federal grant known as Project Search, suggested a new concept.

"An examination of the use of computerized criminal histories shows the need for rapid access does not exist in interstate exchange of records to the same extent it does for in-state records," he said.

"We do not have to collect record segments from dozens of states to assemble one complete record as was once believed. In fact, the number of offenders who have more than four states involved is less than one-tenth of 1%," he said.

About two-thirds of all multistate offenders are only active in two states, he added.

Two states could cooperate with minimum cost and minimum loss of control over their records by extracting from their own CCH records the FBI number and state identification number (SID) for each arrestee and prepare a magnetic tape of such abstracts, Marx said.

Tapes from the two states could be sorted and merged and each state given a new tape with the two SID numbers for each multistate offender, he suggested.

The new tape could then be merged into the state's CCH file so subsequent inquiries could provide sufficient information to allow an inquiry on an out-of-state offender to get the rest of the record.

Of course, not all potential benefits of CCH would be available, but the "system" would be immediately useful, inexpensive and easy to implement and would bypass all present problems that plague the present FBI-run system.

Additional states could be accommodated by sorting, merging and selectively generating tapes. States that did not wish to join would not have to do so, Marx said.

As more states join, a minicomputer might be appropriate for the application; because of the mini's simplicity, the computer costs to each state would be modest.

If participating states want on-line access to the FBI/SID record, that could be arranged without forcing other states to make a similar decision, he said.

Offenders' records could be matched with corresponding FBI numbers at the FBI's Identification Division. If the FBI wished to participate, a data entry station in Washington could be added to the system.

If some states would prefer to enter a full name file rather than only the two numeric identifiers, that, too, could be arranged. The key word is "accommodate," Marx said.

The action of two states could result in a national CCH system "without national commissions, a $600 million price tag or any Attorney General decisions – just CCH," he said.

Nlets used this technique to develop its present interstate exchange system for vehicle and drivers' registrations.

"With virtually no formal organization, Nlets managed to come up with a system in which states could participate whether or not they were highly automated," Marx pointed out.

Unlike the Law Enforcement Assistance Administration's Comprehensive Data System (CDS), no funding scheme would tie other rewards to whether a state participates in CCH.

The Nlets drivers' registration system, started much like this, today has 30 states participating and has proved itself very useful, he said.

Bankers Association Seeks Supreme Court Review of CBCT Case

WASHINGTON, D.C. – The American Bankers Association (ABA) has filed an *amicus curiae* brief before the Supreme Court in support of a petition requesting the court to hear an appeal of lower-court rulings on customer bank communications terminals (CBCTs).

The ruling stated CBCTs were bank branch offices and therefore subject to federal and state laws governing branches.

The ABA contended the lower-court ruling would "hobble commercial banks in freely experimenting with the delivery of electronic funds transfer services" to their customers and would deny the public the benefits of expanded competition.

"The development of CBCTs represents a significant technological advance unforeseen in 1927 when Congress amended the National Bank Act to permit national banks to branch," the ABA brief argued.

In holding that the definition of "branch" in the act covered CBCTs, the lower court looked exclusively to the principle of "competitive equality" between national and state banks, it said, stating that the principle was not the motivating factor behind Congress' passage of the act.

"The use of CBCTs promises savings to consumers, merchants and banks in excess of $1 billion per year," the ABA contended.

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A Mile Underground

Mini Monitors Mine Noises to Protect Workers' Lives

KELLOGG, Idaho – When striking miners return to work at the Sunshine mine here they may be afforded a little more "job protection."

A minicomputer located a mile below the mine's surface will be helping mine engineers cope with the problem of sudden dangerous rock bursts.

The Sunshine mine is the nation's leading silver mine as well as the country's largest domestic antimony producer. It also produces copper, lead and gold as byproducts of the silver and antimony mining.

Overstressed rock has frequently posed a danger to miners, according to Kenneth Castleton, chief engineer of the mine. An IBM 7 has been installed as a preventative measure, to assure, he said, that engineers are aware of where and when rock blasts are about to occur.

Although the minicomputer is "fully operational," Castleton said, it hasn't yet been used in a crisis situation because the miners are on strike and rock stress is not being artificially altered at present.

"We get it out of balance when we start mining and creating new excavations," he added.

The United Mine Workers have been on strike since March, he noted.

The configuration at the mine includes an 8K IBM 7 hardwired to a signal filter which in turn is hardwired to 27 geophones, or small microphones that pick up rock noises.

"The computer itself gathers all the information, calculates it and reports it to the rock mechanic engineer." Such information as location, time and magnitude of rock noise events is calculated and logged by the system, Castleton added.

It is the engineer's job to interpret the end results of the tedious calculations that "would be impossible to do by hand." Any decisions that are made come from the engineer, Castleton said.

"We have more than 400 miners working below ground," Castleton continued. "Their safety and productivity are closely tied to the control of rock bursts.

"When noise levels reach the danger point, we then know where the pressure has built up and can evacuate the area. And, given enough advance warning, we can drill and blast relief holes to disperse the stress," Castleton noted.

"We are attempting to control both horizontal and vertical stresses in the rock which are a result of both the depth of underground work and of the way the rock was folded and pressed when mountains were created," Douglas Sumway, rock mechanic engineer, noted.

"There are always snapping and popping noises in the mine as a result of the rock adjusting to the high stress. In the past, old-timers would wait until they heard no noise and then clear out. Silence seemed to precede a big burst," he added.

Illinois Laws Limit Banking Terminal Uses

CHICAGO – It was one step forward and two steps backward for banks here as some legislation affecting customer-bank communications terminals (CBCT) was enacted and some was struck down.

Gov. Dan Walker signed into law a bill permitting a bank to open a second pedestrian or drive-in facility within 3,500 yards, or two miles of its home office.

Illinois law previously allowed one automated facility within 1,500 feet of the main office [CW, July 5].

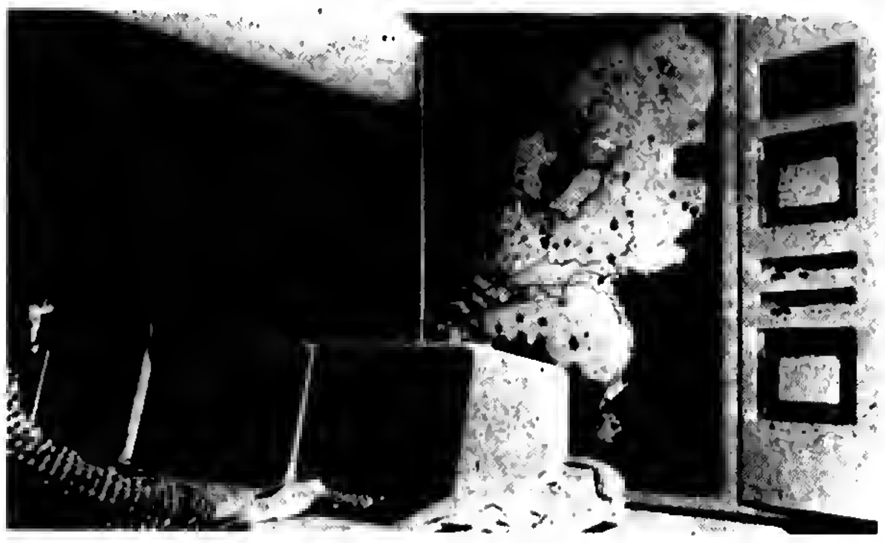
The new law clearly limits these facilities to personal banking transactions for current bank customers. They will not be authorized to open new accounts, accept loan applications or offer services other than deposits, withdrawals, transfers and loan payments.

In a separate action, Circuit Court Judge Raymond K. Berg struck down the Chicago ordinance which the City Council adopted last month to legalize "community banking offices."

The ordinance, passed under the home-rule statute, was contested by the State of Illinois Banking Commissioner, who asked it be ruled unconstitutional [CW, Aug. 2]. Illinois law prohibits branch banks.

At the same time, Continental Illinois National Bank and First National Bank, with CBCTs already installed, had petitioned to have the ordinance ruled constitutional.

READER SERVICE CARD PAGES 19 AND 20 MISSING.



An illuminated wall map, which shows all regional monitoring stations, lights up when sulphur dioxide concentrations for these stations surpass threshold values stored in the computer.

With Distributed Net

Netherlands Tackles Pollution

THE HAGUE, The Netherlands – Officials here are doing something about their country's air pollution problem.

A network of minicomputers attached to a host CPU is monitoring the sulphur dioxide concentration throughout the nation.

Sulphur dioxide (SO_2) acts as an indicator of the overall level of air pollution, government officials noted. If a predetermined threshold value is exceeded and rapid wind dispersal seems to be unlikely, the various industries in this country are required to restrict their operations.

The National Monitoring Network is divided into nine regional networks, each with its own Philips minicomputer. Minis used are the P-852, P-856 and P-857.

Each regional network is linked to a Philips P-9200 CPU at the National Air Pollution Measuring Centre at Bilthoven, which is located in the geographical center of the country.

Some 250 "sniffing posts" located both in a regular geographical grid at distances about 18 miles apart and more frequently spaced in highly industrialized and densely populated areas sense the SO_2 concentrations each minute and pass on the results to the minicomputer in each of the nine regional centers. The centers process all of the measured data and transmit it to the main computer.

The minis at the regional center also provide information about wind direction, wind speed and atmospheric humidity, obtained from 40 air monitoring units equipped to take meteorological data. The data can show where dangerous concentrations may accumulate, the officials said.

At the regional centers, a printer linked to the mini prints out the hourly average values for SO_2 in micrograms per cubic meter, together with the date and time. The mini also carries out various calculations to correct the concentrations measured for the effect of location, time, wind direction and season.

If the corrected values, averaged for the whole region, rise above a specific threshold, the computer gives an internal alarm.

If, on the basis of meteorological information and other factors, it seems that the weather conditions will remain unfavorable for at least the next six hours, a coded message is sent via a dedicated phone system to certain companies, who in turn stop such activities as the cleaning of boilers and stacks and switch to low-sulphur fuel.

The detection equipment can locate a specific source of pollution as well; officials noted.

At the central facility, monitoring stations registering a higher SO_2 concentration than the values stored in the system are displayed on an illuminated wall map.

The data stored in the central system is used to compile statistical and model studies to help the government achieve more sophisticated supervisory and alarm systems.

Regional and national surveys of air pollution are produced monthly, semi-annually and annually, and studies of future trends are compiled.

Cooperative Nets Urged for EFT

BRIDGEPORT, Conn. – Banks exploring electronic funds transfer (EFT) systems should consider regional cooperative development first, according to John French.

Addressing a recent bankers meeting here, French, vice-president of marketing for National Sharedata Corp., said banks could realize many benefits, including economic gains, by sharing an EFT network on a cooperative basis.

Developing a system in a local trade area is important because over 70% of all checks written are written locally, French said.

Sycor introduces the in-between machine.

More capacity than a stand-alone intelligent terminal. More economy than a mini-computer.

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The Sycor 400 series of distributed data entry and processing systems is now available with Cobol capability. At no extra cost. So while you're doing Cobol processing, remote job entry and file maintenance in the background, concurrent operations such as intelligent data entry and inquiry/response can be performed in the foreground. You save time by processing more data faster. And you save money, by getting mini-computer processing power at a stand-alone-terminal price.

$600 per month means more dollar power.

You can lease a Model 410 directly from Sycor for one year for only $600 per month. And you get a lot for your money.

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- binary synchronous communications (1200-4800 bps)
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Editorial

Diminishing Alternatives

As the fall season of business activity begins, there are some conflicting indicators of how the DP industry is doing. Basically business is good and getting better.

And yet in almost every category within the industry there is an example of a supplier that is having a hard time and appears to be hanging on. These cases can be dismissed as isolated incidences of poor business management, but the causes may lie deeper.

As the DP industry matures, the list of viable suppliers has been slowly, but steadily, shrinking. Most users are very much aware of which suppliers are healthy and which are not.

The key issues behind this spotty trouble in the midst of a business upswing may lie in the changing character of the DP industry. There is no doubt that the dominant suppliers are becoming more aggressive. And sheer size and resources tend to favor the major supplier.

For users, the risk of depending on a small unproven vendor becomes greater each time a marginal company succumbs to business pressure. At the same time, any attempts to limit the power of the giants – AT&T and IBM – appear stalled in the cumbersome legal system.

Lower prices and faster machines with greater flexibility are a boon to the user. These are real instances of technology being transferred to benefit the customer.

But, at the same time, there is the nagging feeling that the available alternatives are slowly, but surely, being decreased. Even the major suppliers have serious reservations about becoming the only suppliers.

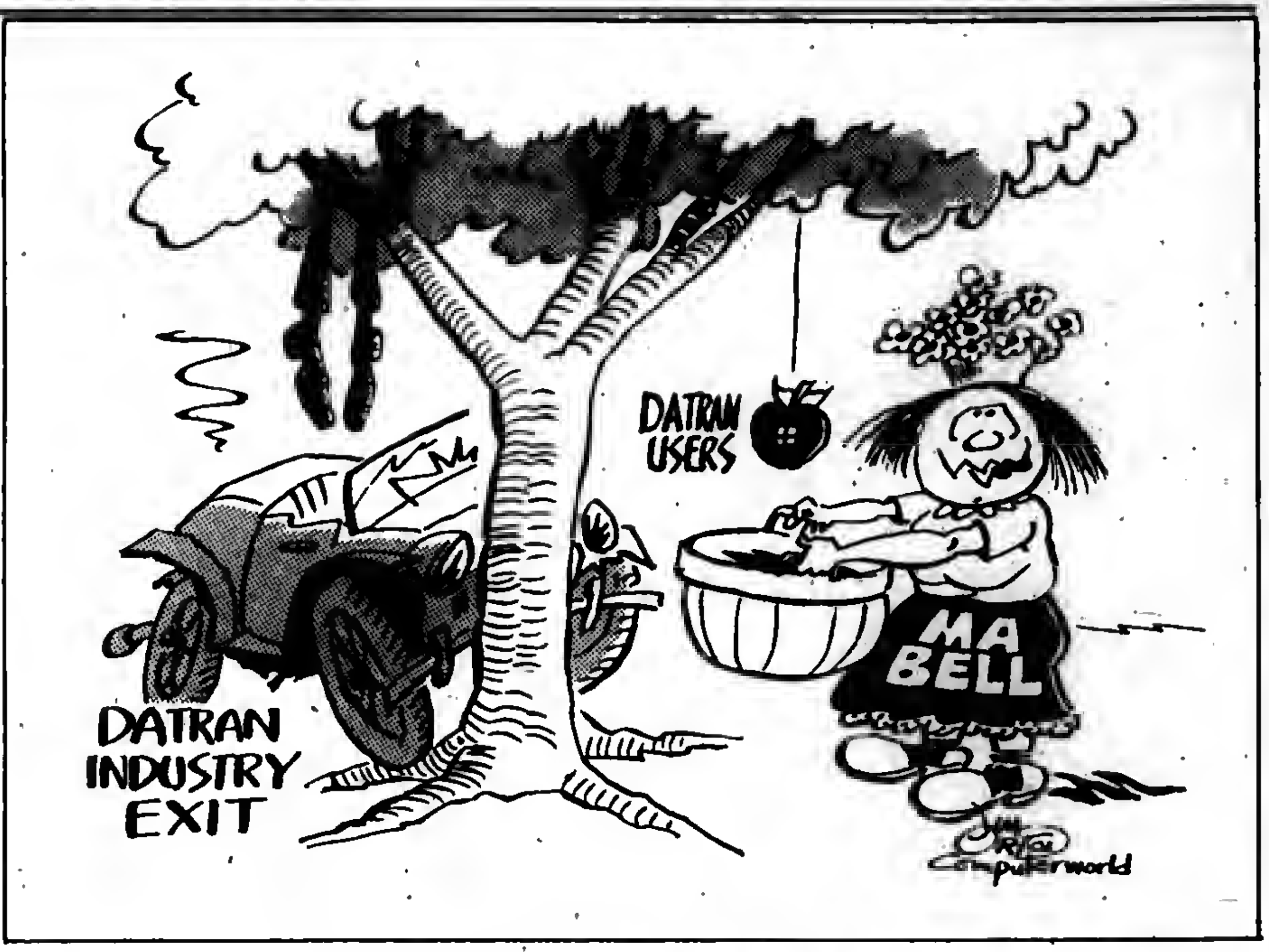
Perhaps the DP industry, like so many before it, is destined to be dominated by a small group of super companies. But much of this industry was founded on principles advanced by small innovators who pioneered key developments. Many of these innovators patterned companies around their product only to be later swallowed up.

The real advantages of competition lie in the prospect that there is always room for the innovator that has something users need. If that spark of competitive innovation is snuffed out, we may one day be working in a stagnant industry.

Research and development is too important to be entrusted to a few companies with the power to decide when products should be announced for the optimum marketing advantage. Creating an environment where the little guy can operate concerns us all.

Users on the verge of making important systems decisions should consider all suppliers. And above all, management should guard against policy statements that prohibit novel answers in the DP center.

The DP manager should be an ally of management in taking calculated risks to optimize corporate profits. A sterile DP center could be the outpost of a sterile corporation. That is something for every company to avoid.



'Lucky I Just Happened to Be Passing By . . .'

Letters to the Editor

In Response to Responses:
'Standard' Misused in DP World

In reply to the replies [CW, Aug. 30] to Anita Benson's letter [CW, Aug. 16], I offer the following:

To James M. Brown: I suggest he redo his math degree. The mathematical concepts he referred to are not standards, but rather they are hypotheses, rules and conclusions. I have never seen the word "standard" used in mathematics quite the way it is used and misused in the world of the computer. And, how about nonstandard analysis, non-Euclidean geometry and, in complex analysis, the "non-mean value theorem"?

To Dave Myster: Basic the language of the artist? Did Michelangelo carve in soft cheese? Did Rembrandt paint with mud?

Now the concept of structured programming (and I do indeed recommend it to my students) has admittedly been badly needed especially for the benefit of the retarded programmer and his victims. But the price for this new discipline has been the rise of a new strain of computer pedant.

An amusing note: McGowan and Kelly in their *Top-Down Structured Programming Techniques* define a structured flowchart essentially as a nested combination of "fundamental" flowcharts from a given, but arbitrary, set S.

Thus, if S is the set of all flowcharts, then all flowcharts are structured and so are all of Benson's creative programs.

Terence J. Reed

Greensboro, N.C.

Headline Itself Misleading

The editorial in the Aug. 30 issue of *Computerworld* asked users to bring "distorted and misleading stories" to the attention of the editors of the publications in which they appear.

In accordance with that request, I should like to call your attention to a headline which appeared on Page S/17 of that same issue which read "Minis, Satellites Cut Marine Corps Turnaround 300%."

To cut turnaround by 100%, output would have to be produced the instant input was received. To cut turnaround by 300%, output would have to be produced prior to input. That would be a real breakthrough in systems performance.

I hope this may pique your interest in the field and "lead to better and more accurate coverage."

David B. Goldstein

Elvid Management Services, Inc.
Fort Lee, N.J.

Benson Wrong on Many Points

I read with considerable interest the bull session ranting of Miles Benson on Snobol 68 [CW, Aug. 23] and would like to point out he's wrong on nearly every point if, by Snobol 68, he's referring to Snobol4, the language introduced by Bell Laboratories in 1968.

First of all, nobody's really convinced Snobol4 is the most rigorous language ever invented. It is, however, one of the easiest to write in; all you have to do is leave spaces around operators and nearly anything you write is correct.

The rigorous definition was, in effect, the machine-independent implementation which is now available on nearly every medium- to large-scale computer on the market. Almost no implementor sneered as he labored the few months required to put the compatible compiler-interpreter "on the air," except at the inherent inefficiencies of machine-independence.

As for programmers using Snobol4, the number is probably in the thousands, world-wide. I have taught it as a programming tool and have made extensive use of it in the engineering of a new Cobol compiler for my employer, a major computer firm.

Therefore, I don't consider Snobol4 a failure and don't see how Benson does.

Michael D. Shapiro

San Diego, Calif.

Data Past

Five Years Ago
Sept. 11, 1971

NEW YORK – Digital Equipment Corp. became a full-fledged mainframe supplier when it expanded its Decsystem-10 line of computers by adding a Decsystem-1040, a 1050 and 1070 and two dual-processor intermediates, the 1055 and 1077.

The DEC machines were in the IBM 370/135 to 370/155 range and included a complete line of software, double-density disks, communications equipment and built-in, double-precision floating-point hardware.

Prices for the machines, aimed at medium-scale users, ran from $180,000 for the 1040 to $893,000 for the dual-processor 1077 with minimum core memory of 131K.

– – –

LOS ANGELES – This city became a test site for cross-referencing of 14 different types of ordinary identification used to cash checks when the Law Enforcement Assistance Administration gave it a $1 million grant to stop money gained from forged checks and other worthless documents with the help of a computer-based detection system. The system was dubbed Automated Worthless Document Index by the Los Angeles Police Department.

The French Dilemma

Computers aside, the French really know how to live. They grow their fruits and vegetables to maximize flavor instead of shippability, drink wine instead of soft drinks (and reuse the bottles), and remember how to bake bread. They are great at electrical distribution, fast trains, and operations research. But they got off to a terribly late start in our field, due to many factors: the physical and psychological damage of World War II, the rigidity of their educational systems, the small size and conservatism of their industries, the dullness of their business machines company (Bull).

And when they did start, there was no plan. The French are great planners, and there is an interaction at the national level between government and business (the Patronat) which, while not as vigorous as Japan, Inc., makes planning effective. The nationalized industries also provide connective tissue. But Machines Bull, and the little outfits like Logabax, did not benefit from this, and when the former was foundering, the deGaulle administration could not react in time. Hence the sale to GE – a horrid bone stuck crosswise in the throat of Gallic pride.

So a planning organization was set up after the fact, the Delegation a l'Informatique, under a bright but not experienced leader, Maurice Allegre. He wore two hats: was to get some hardware capability going, and also to use the IBM and Bull equipment installed in government and controlled industry more efficiently – which meant preferential procurement as soon as there was anything to procure. That led to the creation of CII, the IRIS line of machines, a share in a European consortium called Unidata (now thoroughly defunct), and so on.

The by now quite powerful and attractive private software and OR houses benefited slightly from this, but not nearly enough. They turned to English partnerships, and later of course to work in the OPEC countries, especially Iran. Their success, without much help from the government, demonstrates the quality of *les gens*.

Honeywell took over the General Electric mishmash, and finding it hard to move, ran a garage sale. There was turmoil in the Delegation; Allegre got ground up in the machinery, and some defense *types* took over. In the upshot, the government helped CII and some heavy-industry outfits buy back control of poor battered Bull. Unidata collapsed. Philips of the Netherlands swallowed its losses, fired two thousand people, and left the arena. What a hecatomb – of course, the public relations boys called it a great victory!

Now what do we see? A concentration on central processor design, manufacture and sales, with heavy preferential procurement guaranteeing a rather minute market. Peripheral equipment, although much more than half of the hardware, is to be bought elsewhere; not even from Honeywell, which has sold off that capability to Control Data. Software I don't know: perhaps in-house, more likely shared with Paris cottage industry. And the heart of the technology, the center, the limiting factor: the chips? To be bought from Fairchild or Motorola or Nippon Electric, or some such.

Why couldn't they have inverted the concept? The investment, the losses to be covered; the government and controlled-industry purchases, the marketing costs outside France, will run well over a billion dollars by the end of the decade. And to a considerable extent it's all at the mercy of IBM; a blockbuster announcement this year or next, and the system designs are obsolete – the hope of sales outside France, vanished.

But, you may say, 'twas ever thus – IBM whistles and everybody else dances. True, but in the French case there was an alternative: the solid state technology itself. They did not have a huge internal market like the Japanese, demanding a systems capability, and heavy marketing. But they had good basic science, a major nuclear establishment, and lots of proud money. How much better to have invested in a major LSI, and soon a VLSI, development and manufacturing facility. Buy the computers from IBM or ICL or Univac or Fujitsu – IBM manufactures in France, employs more French than any other electronics company; Fujitsu would relieve the depression of American dominance.

There is as yet no really powerful pan-European technological combine, at least in our field. Unilever, Shell, Nestle come close. Could not Siemens and Ferranti and a new French enterprise come together, as Unidata never could, and make a powerful challenge to the Americans and the Japanese, and even to IBM, in the chip business?

It's probably too late. The die is pretty definitely cast. But what an opportunity! Of course, the pride of politicians and customers is more easily gratified by shipments of room-sized computers. But down inside, the boast is made hollow by a thimbleful of tiny 16K chips the French will not make.

Herb Grosch

Charge System Design Errors Cause Needless Chaos

The Taylor Report

By Alan Taylor, CDP

California First Bank runs a Master Charge operation and, like all other Master Charge franchisees, must use the information it is given. The information that gets transmitted to franchisees is simply not very good; when trying to massage it to usable form, some design errors undoubtedly occur. But there is simply no reason for a single transaction to encounter so many design foul-ups as one did recently.

It all started on March 12 when Continental Airlines Houston office charged and accepted $20.83 for an air-freight package being sent by Larry Nebel, Tymshare's central region manager. Although Texas, like any other state, insists that businesses have local addresses, the Master Charge system neither cares about where a charge is made nor who accepts it from the customer. Their sole concern is where payment is made – in this case, to Continental Airlines in Los Angeles.

The fact the system gives the identity of who receives the money, rather than who accepts the charge, is a well-known problem which California First must have been aware of when they designed their own system of receiving money from its card-holders in due course.

Apparently, on April 2 Continental got around to depositing the item with its bank. The fact the charge occurred in Texas had been lost, as was the fact it was a service that Continental provided. All that remained was an 11-digit reference number, the deposit date, the amount and who received the cash that was now wanted from Nebel.

The April monthly statement went out to Nebel a few days later, but the charge was not included.

Four weeks elapsed after the Continental deposit before it was posted on the California First's April 30 accounts. Then, on May 6, the system churned and produced both a statement and a Descriptive Transaction Enclosure, the relevant parts of which are reproduced in the box.

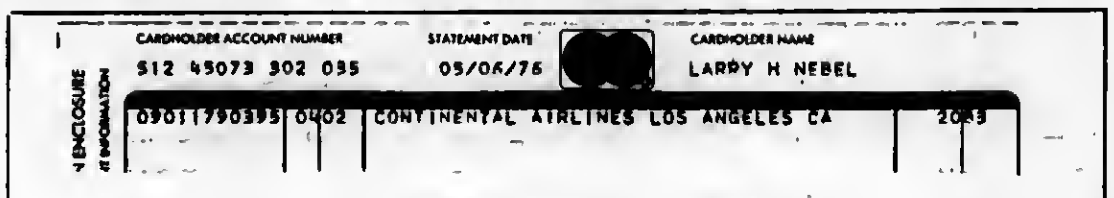
Nebel received both the enclosure and statement and examined them. Now he had two documents, but they couldn't be tied together. The California First people had seen to that by playing ping-pong with where to put what.

The idea of risking redundancy by repeating anything other than the amount obviously frightened them, thus three design errors resulted.

- ● Error Number 1. The enclosure has a reference number. If the statement had one the problem would have ended there and then. But California First omitted that from the statement line, despite plenty of room.
- ● Error Number 2. The statement has a posting date. If the enclosure had one, it would have helped Nebel tie the two together. But California First went further than merely omitting the posting date from the enclosure; it provided as one of the four fields a "date" – that could mean anything or nothing.
- ● Error Number 3. The enclosure has a merchant identification which is unavoidably wrong as mentioned. Even so, it does permit some continuity to be used between the enclosure and the statement. The statement, however, omits the merchant because by now it's just a book entry on Nebel's account. But California First thinks providing lots and lots of room on the statement for a 'description' practically forces them into describing something – so, not having any idea as to what the charge is for they default by printing "purchase." Perhaps they think that such a label is better than the more accurate word 'charge'.

Nebel, upon receipt of this material and the March 12 air freight charge slip makes a table showing the three dates: March 12, April 2 and April 30. He finds he doesn't know whether there are one, two or three items.

The forms designers of California First have done a lousy job of tying together even their own statement and its enclosures. Amounts are simply not enough. Many duplicate amounts appear – particularly from airlines.



ENCLOSURE INFORMATION

CARDHOLDER ACCOUNT NUMBER 512 45073 302 035
STATEMENT DATE 05/06/76
CARDHOLDER NAME LARRY H NEBEL

09011790395 0402 CONTINENTAL AIRLINES LOS ANGELES CA 2083

RETAIN THIS STATEMENT FOR YOUR RECORDS

CALIFORNIA FIRST BANK master charge statement

5073 302035 ACCOUNT NUMBER
LARRY H NEBEL NAME
THIS MONTH'S STATEMENT DATE 05 06 76

	DESCRIPTIONS	
APR 30	PURCHASE	20.83
MAY 6	PERIODIC CHARGE ON ADJUSTED BALANCE	.66
MAY 6	LATE CHARGE	.50

The top entry shows part of the April 2 Descriptive Transaction Enclosure sent out in support of the April 30 entry (bottom) and the May 6 statement (middle). How is someone supposed to tie these together except by the amount?

Dangerous Terminology

Default descriptions, in particular, should be only very hesitantly used. To call anything a purchase, when it is now known what really happened, is simply dangerous. Even the horror of "retail transaction" is a little better than "purchase." It is much less likely to be wrong.

And don't think because someone will argue "But you can purchase a service . . . and therefore we are technically correct," that the design is not wrong. Purchase, unidentified as being a noun or a verb, indicates that something tangible, like a box of chocolates, was obtained.

Second Design Crash

This second level design crash is just as destructive to DP credibility as the basic credit card merchant/depositor in due course confusion. But it is a lot less excusable. It takes time to create a network that carries both sets of data around the system and we don't have one.

California First just doesn't get the data to set that right. But it can tie its own pieces of paper together a bit better than it is doing just on its own authority. Then it would be reducing rather than increasing the basic problem. Here's hoping that it – and others – start doing so soon.

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To Speed Information Flow

More Practical Training Needed for Systems Analysts

By C. A. Knepp

Special to Computerworld

Reader Commentary

The world of DP is a rapidly changing and progressive one. It has given us the opportunity to bridge communication gaps within our companies and between geographic boundaries. However, all too often we aren't really closing the gap, but widening it.

System Information Flow (SIF) can be complex and we should investigate why. The complexity boils down to our most prized resource: people.

Are we utilizing or do we even have available the adequately trained people to assure the best possible SIF? In many cases, we don't, particularly in reference to the Information system or system analyst specialists.

A system analyst or information system specialist, simply stated, should be a liaison between top management, programming and operations. He is the initial investigator In any company's overall design of an information network or flow, whether it be automated (semi or fully) or a manual flow.

At this point in time, educators have pretty much agreed in recent years on a basic system analyst definition through four unique phases: the study phase, the design phase, the development phase and the operation phase.

The tragic truth, however, is that very few academic institutes today offer an In-depth educational program for the area, although many are convinced the time to begin one is approaching.

What must be done to bridge the gap between management, programming and operations? The answer is simple – adequately trained system analysts ready to take their place In fulfilling the needs and possessing the capabilities of communicating with management, programming and operations.

To go one step further in our definition, one might ask then exactly what will a system analyst do? The answer is in part suggested by the educators phase definition. But let us look at a typical example of how it could ideally work and then later at how it is often done presently.

Top management determines the need for additional Information, say an expansion of the present system into a newly created division. The request is turned over to the system analyst, who in turn approaches phase one; a clear definition of the problem.

This report probably would then be channeled back to management for review. At this point, the interpretation is directed towards management comprehension. If the report is deemed feasible, phase two is implemented, that being a complete design of the information network, including system implications and report specifications and programming requirements.

Phase three would be development, including implementation planning, testing, training, conversion, equipment installation and so on, all coordinated through programming, operations and management.

The final phase is the actual implementation and performance evaluation. This phase should be channeled through all three areas and at all three levels of comprehension: This should allow for the best possible information flow design and allow the expertise of all three areas to be fully realized – without an undue burden or misunderstanding in any level.

However, all too often the following is actually what occurs. Top management perceives the need for additional information, through a possible expansion of the present information system for a newly created division. Management approaches the programming department, which in turn is left with no alternative but to complete the first three phases under their own interpretation, which management may or may not fully comprehend.

A conclusion one could draw from the above correlation is that delegating separate and distinct areas of responsibility, channeled through a system planning department may be a tremendous advantage and, in the long run, prove cost justifiable.

Knepp is DP department head at Bank Virginia Service Co. and curriculum advisor and instructor at J. Sargeant Reynolds College.

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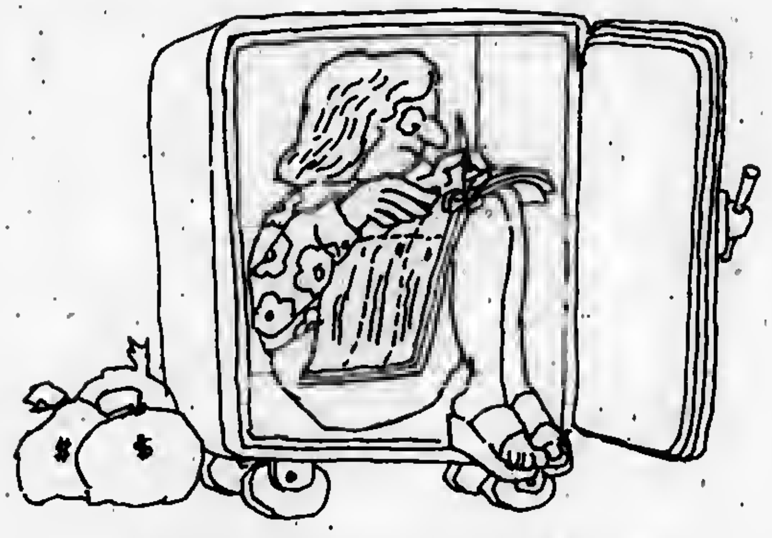
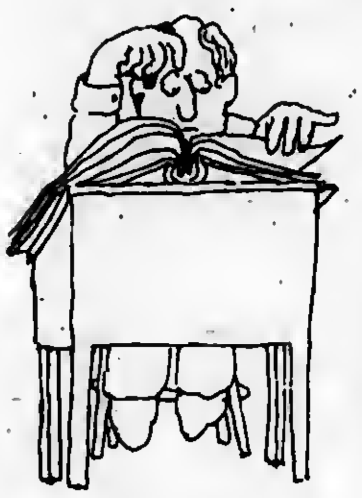


The accounts payable and receivable system.

The general accounting system.



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Consumers Unenthusiastic About EFT/Privacy Rules

By William O.Adcock and Anne M. Moore
Special to Computerworld

"Legislating for complete privacy may be about as effective as legislating against sin." That is the blunt assessment of a federal regulator. It also describes the frustration felt by other consumer advocates who are concerned about privacy protection in electronic funds transfer (EFT) systems.

Consumerists generally agree that personal data privacy is one of the most important EFT issues. However, major consumer organizations are not enthusiastic about sweeping legislative safeguards similar to the Privacy Act of 1974 which pertains to federal records systems.

These findings are based on a study of EFT issues conducted by Payment Systems Research Program of Payment Systems, Inc. (PSI). The PSI study included personal interviews with representatives of consumer groups and regulatory agencies, as well as a review of Congressional testimony, policy statements, and other published material related to consumerist views of EFT.

The PSI study concluded that only one privacy protection measure is strongly supported by most consumer advocates. A strengthening of rights of redress is most often favored. Consumerists believe that legislation is needed to make it easier for an individual to collect damages if personal data privacy is abused.

Consumer Federation of America (CFA) included such a provision in its "EFT Policy Resolution," adopted in January 1976. CFA proposed that unauthorized use of the detailed economic profiles of an individual (information made more easily available because of EFT) should be outlawed, with strict civil penalties for violations.

Ralph Nader's National Public Interest Research Group (NPIRG) included a similar remedy in its "Model EFT Code." The Nader group proposed that any financial institution guilty of unauthorized disclosure of information about an EFT card holder should be liable, to the individual, for $1,000 plus court costs and attorney's fees.

Support for a stronger right of redress is not surprising. The two major federal privacy laws, the Fair Credit Reporting Act of 1970 and the Privacy Act of 1974, both provide for collection of damages. It may seem surprising, however, that consumerist demands have been this limited.

EFT privacy concerns generally pertain to fully developed EFT systems. The long-term nature of these concerns may be one of the reasons consumer advocates have been slow to support other legislative proposals now under consideration.

For example, Melinda Mount and Robert Thompson, consumer affairs specialists for the Federal Home Loan Bank Board, questioned the need for privacy legislation at this time, since their agency regards EFT as "experimental."

Peter Schuck, Washington director for Consumers Union, noted pragmatically that "any such legislation would take considerable time to get through, if only because the Privacy Act with respect to federal agencies has only recently gone into effect and Congress will want to see how that works out."

Michael Sterlacci, acting deputy director of the Office of Consumer Affairs, has been the most outspoken consumer advocate on the subject of EFT privacy.

"Completely unrestrained, the ultimate EFT system could reveal almost everything about an individual, even to the point of mercilessly tracking his movements. Consumers legitimately fear a system which centralizes and coordinates data about their lives that gives a clear picture of their life styles, political, economic and religious beliefs, opinions and interests," he said.

Despite these concerns, Sterlacci does not support new privacy legislation. He believes consumers now have adequate protection because "the bulk of separate checks in the system makes data correlation difficult."

Interviews with consumer advocates suggest another reason why privacy legislation is not more widely supported by consumerists: Most of the proposed new laws do not address the major fears about EFT privacy.

Reader Commentary

Most new proposals, as well as Fair Credit Reporting and the more recent Privacy Act of 1974, only define responsibilities and liabilities of records keepers. Consumerists are also concerned about privacy abuses by unauthorized third parties and by government agencies.

Unauthorized access, particularly through remote penetration, is a difficult subject for legislation. The EFT Policy Resolution of CFA includes a demand that "technological means should be developed to minimize computer fraud and computer theft of the data stored in a computer system." The CFA resolution did not include any specific recommendations for enforcing this demand.

NPIRG recommended, in its Model Code, that maximum criminal penalties for computer penetration be established of a $10,000 fine or ten years imprisonment or both. NPIRG also proposed that banks be required to notify all customers if they found that computer files had been "tapped."

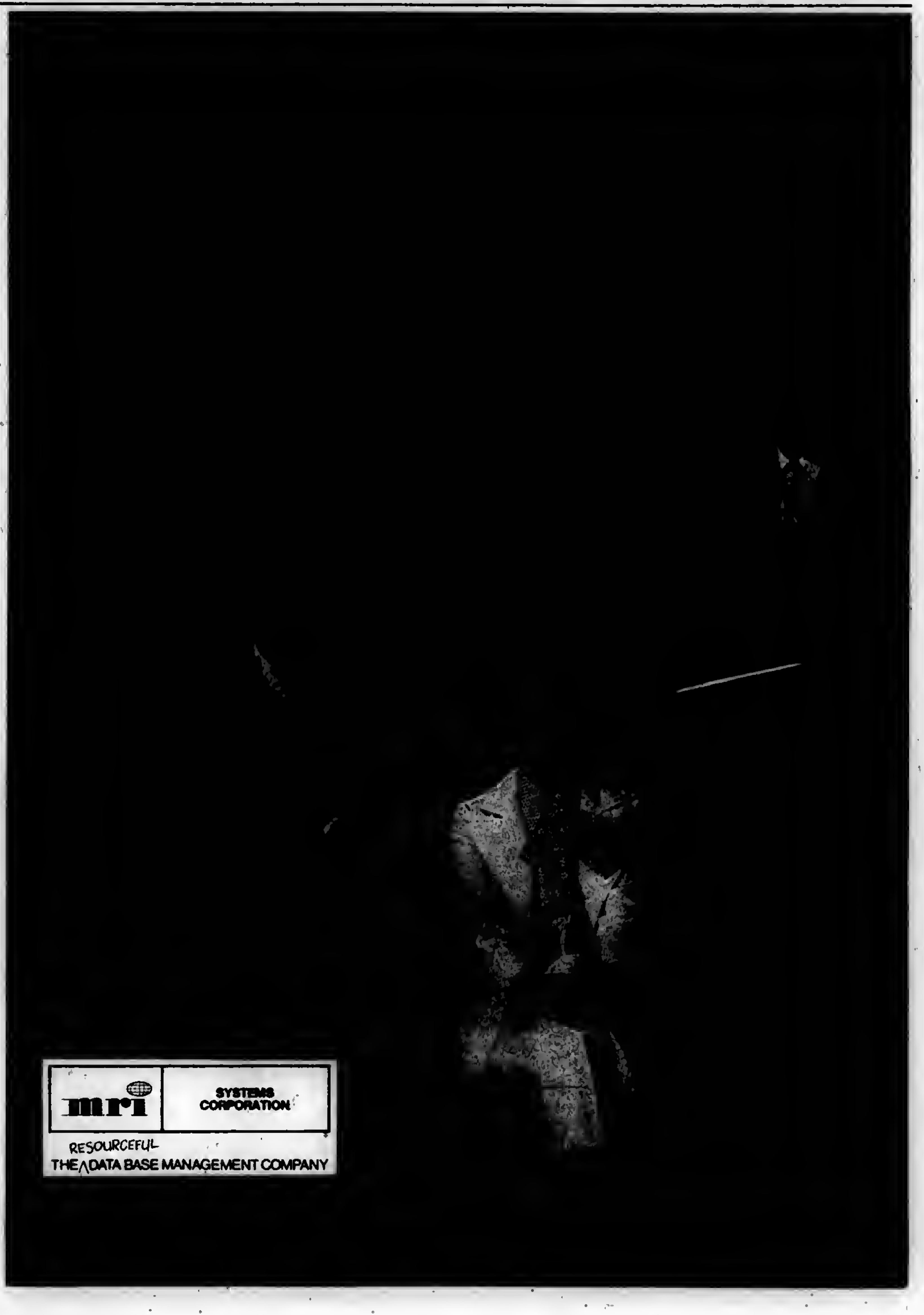
Even Jonathan Brown, banking issues specialist for NPIRG, is skeptical about the effectiveness of these types of provisions. "I'm not even sure they can devise means to find out if someone is tapping it, let alone stop it. I'm sure they can't stop it," he said.

"One of the issues is how much are banks willing to spend to find out."

Many of the concerns about governmental abuse of EFT privacy relate to systematic use of these systems for surveillance purposes. Sterlacci's statement about "mercilessly tracking his movements" is one example. The NPIRG Code includes a reference to "the spectre of political surveillance."

It is not clear what remedies they will eventually choose to emphasize, in addition to rights of redress. It is not likely, though, that consumer advocates will remain silent on an issue they consider to be important.

Adcock is a marketing consultant and Moore a senior associate with the Payment Systems Research Program of Payment Systems, Inc. (PSI), Atlanta, Ga.



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Professionalism Lack Leading to DP Unions

. . . And in This Corner

By Kenniston W. Lord Jr.
Special to Computerworld

More than a year ago I was chastised by Ashley Goldsworthy of Australia for stating that unionism was underway in Australia and that the rank-and-file DP practitioner feared it. However, communications recently received from Australia indicate that the issue is still not resolved.

And while it may not be resolved in Australia, such movements are beginning to stir in this country.

A Tennessee court's decision about programmer overtime might have been the tip of the iceberg. The ruling by the U.S. Department of Labor that data processing activities are not considered "professional" may well add impetus to the movement.

Right under our noses there are some unionizing activities underway, all conducted very quietly and discretely. Already State and Municipal data processing workers around the country are, or are becoming unionized.

So the move is under way.

Several Reasons

What could cause DP people in this country to become unionized? There are several obvious reasons.

First, we have not yet come to grips with what constitutes a profession. We cannot lay claim to being professional because we cannot yet define it. If there are any overt industry efforts to obtain professional credibility, we're backing into them, rather than aggressively pursuing them.

Next, despite the Tennessee and Labor rulings, there is still strong evidence of excessive and uncompensated overtime in many organizations, disguised under job title changes and job-retention pressures. It is no secret that there are data processors in this country who earn an effective hourly rate approximating the minimum wage. Sooner or later, some DP practitioners will become tired enough of that to do something about it.

Fostered by Dissatisfaction

Traditionally this country's unionization activities have been fostered by either the worker's dissatisfaction with exploitation or by foreign competition, as in the case of shoes, textiles, or other commodities produced overseas.

Workers have sought protection from foreign competition by the encouragement of protective tariffs and other forms of collective action. Consider that today much of the hardware you are using, in component form, at least, originated in Japan or Taiwan. Whole devices, specifically peripherals, are being marketed in this country from such sources. Initially, that seemed to be little problem, as there was a vast difference in quality. But foreign quality standards have risen.

Major Impact

Where the major impact upon DP practitioners will be, however, is in the areas of service. It is now possible to get data entry services in the Orient at a fraction of the cost. The turnaround is relatively short, but more importantly, the accuracy is high.

Some of the software currently in use in this country originated in and has been imported from Western Europe. And it works; it's capable; and it's polished. One wonders just how long it will be before systems and programming services are equally available. When they do become available on a large scale, a coalescing force for unionization will exist.

The Great Minds

The great minds of the Orient or Western Europe should be free to market their product wherever they can. But it should be obvious to the casual observer that import restrictions and protective tarriffs might be just as applicable to software and hardware products as they are to shoes and textiles; and it is a valid possibility that such restrictions may well lie in the future of the country.

I, for one, would not like to see a DP union established in this country. There are at least two reasons. As a believer in Right-to-Work legislation, I should not like to see competent people subjected to the traditional union-member role.

More specifically, however, I'm firmly convinced that this is, or could become, a profession in the traditional definition of professionalism, with high standards of knowledge, conduct and practice. There are questions in my mind about the quality levels of work performed by the two types of people.

Happening Now

But, like it or not, I see it happening. It's happening because DP people are allowing it to happen, through unawareness and lack of positive action in the professionalism issue. Like everything else we seem to accomplish, we most probably will not move in that direction until either it is too late to influence the outcome or the single coalescing force comes to bear.

In either case, it is presently in company managements' best interests to ignore either alternative. They do not have to "divide and conquer" for our people are already so divided that no positive professionalism efforts are under way. There may well be some surprises waiting in the wings.

Unionization is clearly a possibility so long as we continue to do nothing.

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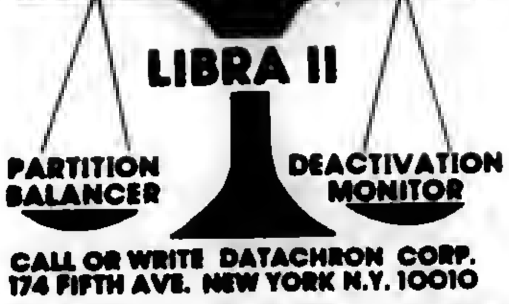

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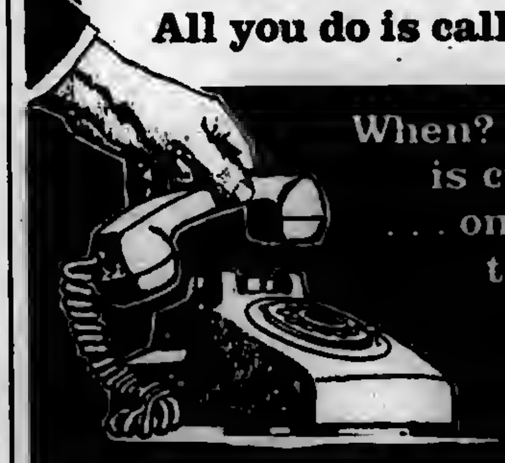

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A NEW PERSPECTIVE IN MARKETPLACE EFFICIENCY

Comments Sought on Proposed Standard for Mumps

By Don Leavitt
Of the CW Staff

NEW YORK – Mumps. A strange name for a programming language.

Programming language? Isn't Mumps a childhood disease?

Yes, *that* Mumps is a disease, but there is a piece of software also known as Mumps. It started as a single installation's solution to a particular problem and was implemented on a particular computer system.

The installation was a hospital and that accounts for the medicinal ring to the language's name. Today, although still known formally as the Massachusetts General Hospital Utility Multiprogramming System, Mumps has been applied to a growing range of applications in and out of the medical field.

It has also been adapted to a growing range of hardware hosts – some 18 or so at last count, all in the minicomputer or small business system range.

Beyond that, to the surprise of many who know of programming languages such as Cobol, Fortran or PL/I, Mumps is already going through an American National Standards Institute (Ansi)-approved procedure under which it too may become a standardized language in the foreseeable future.

The proposed standard is now available for comment from the public and, at the same time; for acceptance or rejection by a specially selected "jury" of some 200 people across the country. The combined comment/ballot period ends later this year.

Unlike the other Ansi-considered languages, however, Mumps didn't reach this stage of the standardization process through Ansi's X3 technical committees. That route seemed marked by infrequent meetings of volunteer participants producing results, typically only after long stretches of time.

Under X3, for example, any suggestion that a given language would be a good candidate for standardization is considered first by an ad hoc group set up to evaluate the technical and economic feasibility of standardizing the candidate language.

Instead of that, a number of Mumps users got together several years ago, recognized standardization was the best way to protect the language as its implementations grew and formed the Mumps Development Committee (MDC).

With strong support from the National Bureau of Standards (NBS), a long-time Mumps user, the language became the first in which standard development work was fully funded.

MDC – and NBS – saw a need to clarify the language in three separate although admittedly related areas. Part I of the standard is a narrative description of Mumps; it contains an overview of the language specification, a definition of the static syntax metalanguage and details of the static syntax.

Part II, now entitled the Mumps Transition Diagrams, is a formal definition of the language described in Part I. It utilizes a form of line drawings to illustrate syntactic and semantic rules governing each of the language elements.

Part III, the Mumps Portability Requirements, identifies constraints on the implementation and use of the language for the benefit of users interested in achieving Mumps application code portability.

NBS Handbook

The three parts of the proposed standard were brought together by NBS, edited by Joseph T. O'Neil of the bureau's Institute for Computer Science and Technology and issued last January as NBS Handbook 118. A foreword, carrying the imprimatur of Ruth Davis, director of the institute, called Mumps "a high-level, interactive programming language developed for use in complex data-handling operations."

Urged on by various users, MDC approached Ansi in late May to determine the best route for Mumps through the standardization process. Since a proposed standard already existed, Ansi sanctioned the non-X3, concurrent comment/ballot period and worked with MDC to develop the appropriate mailing list for the voting.

Spokesmen for both NBS and MDC noted that, in this procedure, Ansi takes into account the comments about the proposal as much as the absolute count of votes for or against it. Thus, neither organization would speculate on the final outcome at this time.

Copies of the standard for those who might like to comment are available from Jack Bowie, chairman of the MDC, at the Laboratory of Computer Science, Massachusetts General Hospital, Boston, Mass. 02114.

Comments should be sent to. Bowie or to Marie Hogsett, Ansi, 1430 Broadway, New York, N.Y. 10018.

'Epat' Adds Audit Trail, CICS Link

BURLINGAME, Calif. – Version 2.1 of Software Design, Inc.'s (SDI) Epat tape management system for DOS and DOS/VS users supports two newly available features – one providing a tape-processing audit trail, the other an interface with IBM's Customer Information Control System (CICS).

The update also includes extensions to the VM/370 interface providing Epat tape protection and control to "any number" of virtual machines operating in that environment and the capability to maintain the Epat catalog "anywhere" on IBM 3330-II double-density disk drives.

Epat itself was described as a catalog, control and volume recognition system. It supports both Automatic Volume Recognition and interpartition use of tape drives so that tapes can be mounted on any available drive, SDI said.

The audit trail feature captures and logs all tape processing done in an installation, including both labeled and unlabeled files. Also included is a cross-reference report, detailing by data set name which programs are using each file as input or output, the spokesman added.

The CICS interface allows the user to display tape status and control information from the Epat catalog on any CICS-supported device. It therefore provides immediate operationally useful data, he said, while the audit trail feature generates management information.

Internally, Version 2.1 includes changes to accommodate the added features and to make generation of copies of Epat easier. A modification to the Tape Copy routine allows multiple files, even if unlabeled, to be stacked on a single reel.

The optional tape-processing audit trail feature costs $50/mo; the CICS interface feature is available for $35/mo. The basic Epat package rents for $295/mo and is required before either of the features can be used, the spokesman noted from 880 Mitten Road, Burlingame, Calif. 94010.

'IMP' Eases RPG Impasse

NEW YORK – RPG-II leaves much to be desired in handling data subelements, according to George Warner, DP manager for Aberdeen Manufacturing Corp., who offers a solution to the problem to any user who wants it.

As he describes the situation, RPG does a "superb job" allowing the programmer to define an input record or an actual output record, "but if your need isn't real I/O, watch out!"

When Aberdeen wanted to use RPG on Cobol-oriented files, Warner went on, "we found situations in which the random keys were composed of one or more packed fields, plus nonpacked fields – a real challenge to RPG."

Warner turned to "a simple aid" written in Assembler that uses dummy SPECIAL files which appear to RPG as exception output files and demand input files. The aid, called IMP, can both compose and decompose data areas immediately in core through output/input RPG detail file areas, which give access, according to Warner, to the indicator logic features as well.

The installation extended this ability to avoid "confusing and lengthy" Move Left Portion (MOVEL) and Move Right Portion (MOVE) series of Calculation statements. For the first time, Warner said, complex print segments with "multiup" output "became a joy instead of a drudgery."

To get the 370 Assembler program on 80-column cards and instructions for mainline use, "just drop a line" to Warner at Aberdeen, 16 E. 34th St., New York, N.Y. 10016.

'Alloc I' Manages DOS Data Sets

NEW YORK – Alloc 1, a DOS and DOS/VS dynamic disk space manager from C-S Computer Systems, Inc., allocates space for permanent and temporary sequential files and eliminates the problems of manually mapping and maintaining disk files in a multipartition environment, according to the vendor.

The package is made up of three programs which can increase the amount of available disk space from 10% to 40%, a spokesman claimed.

The Alloc program itself sets aside the sequential data set (SD) output space location based on user-supplied definitions of how much space will be needed for the job. The allocation routine also sets up protection for the allocated space until an expiration date given by the user.

The Scratch program frees disk space without a service request being issued. The deletion of files is done during the job preparation, the C-S spokesman explained.

The routine called Status gives the user information about the overall amount of available space on a disk pack and the size extents involved. This program is useful when the user is not sure if there is enough space on a pack, he added.

Enhanced versions of the package already under development will in one case handle VS-based operations "even more effectively than this version" and, in another, support indexed sequential and other file organizations, the company said.

Alloc 1 currently costs $3,800 or $350/mo for 12 months under a rental/purchase plan, the spokesman noted from 116 John St., New York, N.Y. 10038.

Musing of a DP Manager

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Letters Start With 'Word/One'

NEW YORK – As a specialized application of its Word/One text processing system, Bowne Time Sharing, Inc. (BTS) has implemented a personalized consumer correspondence management system on its network, according to a spokesman.

The new capability enables corporate and government agency subscribers to store letters and paragraphs on the BTS computer, retrieving and fitting them together as needed to thoroughly personalize all their consumer-directed correspondence, he added.

The basic letters and paragraphs are keyed in through an IBM 2741 or similar teletypewriter and stored at BTS. When letters are to be generated, the identification code of the desired text is keyed in after the intended recipient's name and address.

Special wording, to be inserted at predetermined points within individual letters created from the stored text, is entered after the basic text codes. These inserts may include, for example, the addressee's name, the product or service in question, retail locations, prices and the writer's action or recommendation, BTS explained.

In addition to producing user-tailored letters, the service can store selected information relative to each inquiry or complaint, which can then be used to generate meaningful reports and analyses, the firm added.

The service can be used to answer specific inquiries or complaints or as the base for bulk mailings, when the text files are used along with a name/address file supplied by the client.

BTS has regional communications and service centers in 10 cities throughout the country; the network is headquartered at 345 Hudson St., New York, N.Y. 10014.

Users' Routines to Highlight Inexpensive Software Catalog

NEWTONVILLE, Msss. – Based on the belief that many user sites have a lot of in-house developed routines that could be used by others – if they knew about it – the *1977 Computer Software Directory* is being planned as a high-volume, low-cost publication, according to the publisher.

To be introduced in January with supplements in April, July and October, the directory will include descriptions of commercially developed and marketed systems as well as others available directly from users, he said.

In addition to the base publication and its updates, subscribers can also obtain detailed product reports on individual packages and on groups of systems. These are described as more technical in nature and are expected to include user references in addition to detailed management level descriptions of the products.

Finally, subscribers will also have the opportunity to participate in product rating surveys, conducted semiannually for all products in the directory. Ratings earned through these surveys will be displayed next to the product descriptions, the publisher noted.

Annual subscriptions to the directory are available for $7.50, plus $2.50 for postage and handling. The individual product reports are to be distributed for only a small postage and handling fee, the publisher said.

The fee for s 250-word writeup in the directory and a one-page product report to be sent in answer to inquiries is $50. A 500-word entry and a two-page product report costs $75/year, he added.

Organizations listing products are sent monthly summaries of all requests about their products and may purchase reprints of the product reports in bulk. They also receive a free copy of the directory.

The *1977 Computer Software Directory* can be reached through P.O. Box 270, Newtonville, Mass. 02160.

Securities Database Added on GE Network

ROCKVILLE, Md. – Detailed information on some 28,000 securities, updated daily, and a set of retrieval and reporting tools are combined to make up the Securities Database System (SDS) now available on General Electric's worldwide Mark III remote-computing network.

Securities covered include common and preferred stocks; corporate, municipal and government bonds; stock options; mutual funds; and foreign issues traded in major U.S. and Canadian exchanges, GE said. There are 80 items of information on each security in the dats base.

Updated nightly by Telstat Systems, Inc., the files include a minimum of 10 trading days and 53 weeks of pricing data. They also include up to two years of time-series information on earnings, dividends, interest payments and special distributions, the network continued.

The database is directly compatible with the Data Management System (DMS), a tool for producing ad hoc retrievals and standard reports that has been on the network for some time.

Financial analysis, tabular formatting, statistical analysis and graphic plotting can be performed through other GE routines, the spokesman noted.

In addition, special programs and subroutines are said to be available for retrieving the latest information for any security and comparing the current market value of a portfolio against its original cost, he said.

GE's network can be reached from locations in North America, Europe and the Far East. The Information Services Division, responsible for Mark III service, is at 401 N. Washington, Rockville, Md. 20850.

DYL-260 Linked to IMS

ENCINO, Calif. – An IMS and DL/I interface module recently introduced by Dylakor Software Systems, Inc., is intended for use with its DYL-260 multifunctional report generator package.

The module is designed to operate under DL/I-Entry and DL/I in DOS/VS environments, IMS/360 in OS shops or IMS/VS in VS installations.

Described as an optional module, it is available to DYL-260 users for a one-time cost of $5,000 or $80/mo on lease, the company noted from 16255 Ventura Blvd., Encino, Calif. 91436.

Eleven compelling arguments for choosing a computerized personnel/payroll system from InSci

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Compelling argument number two

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We have satisfied Users. It is imperative that you buy a system that is in actual operation. Talk to users of our system. Visit the site and witness the system in action. Let their success guide you in your decision.

Compelling argument number three

InSci Systems are user-oriented. Every InSci package comes with full documentation and user's manuals that allow tbe Personnel and Payroll Departments to be masters of their own fate. Even our retrieval system (GRS) understands and speaks English. And, because of our experience in hundreds of installations in all kinds of companies, you are assured of an extraordinary level of competence in training. When we leave, you'll be in total control.

Compelling argument number four

The InSci Human Resource System is flexible and economical. It can grow with you. You are looking at the most flexible system available. This system provides the capability you need to support payroll and handle all of your personnel-related functions, including compliance with EEO, ERISA, and OSHA legislation, manpower planning, management development, salary and benefits administration, and health and safety programs.

Compelling argument number five

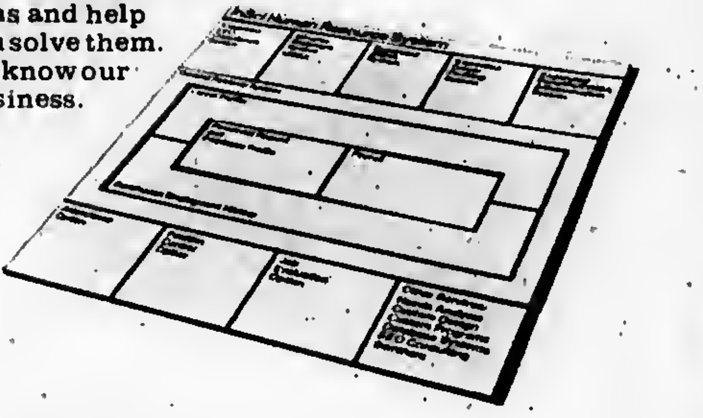
If you don't have a computer—or don't want to use yours—use ours! Manual handling of personnel/payroll information is inherently error-prone, and sometimes even dangerous! Contact our Systems Service Division. With or without a computer you need a Personnel/Payroll System from InSci.

Compelling argument number six

We keep informed—and keep you informed. We hold seminars and conferences to let you know what's happening and what's going to happen. At our Annual User's Conference you'll pick up valuable ideas on better ways to use your system. Management problems, EEO, ERISA, OSHA and other vital issues don't sneak up on you. (Right now we're keeping abreast of the Privacy issue—so you won't be caught unaware.)

Compelling argument number seven

The background and experience of our personnel is outstanding. InSci has been designing systems for more than ten years in all types of environments—you don't have to "start from the beginning" with us. We'll study your problems and help you solve them. We know our business.



Compelling argument number eight

We stay on top of EEO, ERISA, OSHA, Privacy and other legislation companies can no longer ignore. Our systems are designed to handle the extraordinary amount of record keeping and reporting necessary for compliance. Your legal headaches in these areas can be a thing of the past.

Compelling argument number nine

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Compelling argument number ten

The value of our HRS is greater than the price. We will be sure that you get the system that meets your current needs at the best possible price. Then, as your needs grow, we will help you to expand your system as it becomes necessary.

Compelling argument number eleven

InSci looks ahead and stays ahead. This is a growing company of professionals who have tremendous pride in what they have accomplished and, more importantly—an insatiable desire to get better. We look forward to meeting you in person. Meanwhile, to learn more about ERISA, EEO, Privacy and other issues vital to management—send for our 5-Part Personnel Management Information Kit—free. It will tell you even more reasons why you should buy a personnel syatem from InSci.

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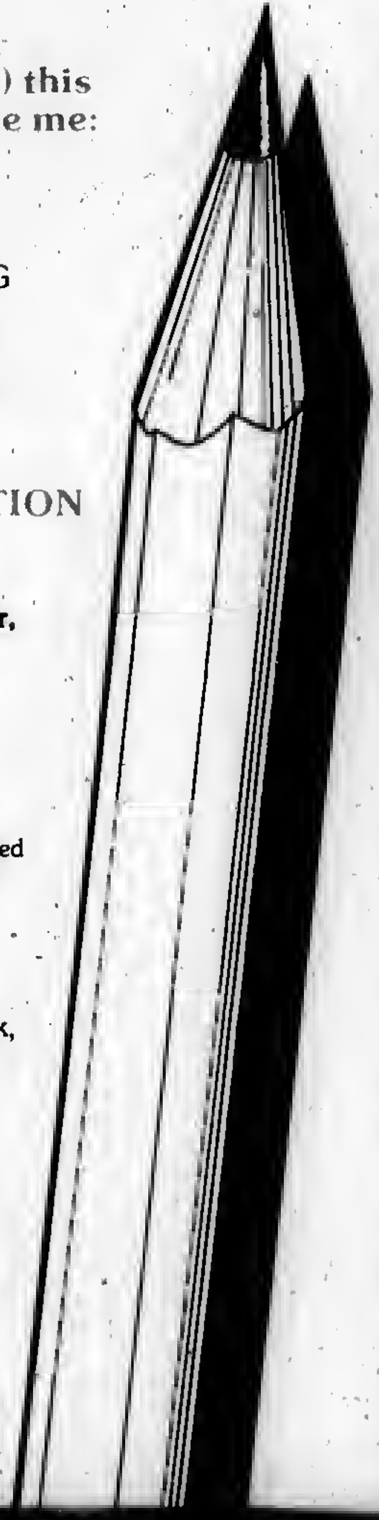

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Hiring Practices Too Rigid, Reject Human Qualities

By Jack Stone

Special to Computerworld

Dear Jack:

A number of fallacies related to the hiring and promotion of programmers and analysts perpetuate the situations you indicate when you wrote "human relations in the DP environment... are generally in a deplorable state" [CW, July 19].

Fallacy 1: A person's past record is a sole measure of the person's capability.

This assumes a person has always worked in jobs he enjoyed and for which he was well suited; it fails to recognize that " square pegs" in "round holes" are rampant. One recent survey estimated nearly 95% of the working people are locked into treadmill jobs. This has been attributed to the difficulty in changing job functions – as a result of the broad application of this fallacious idea.

Fallacy 2: Job background "requirements" must be heavily based on technological specifications.

These specifications have become specialized to the point of being idiotic. An applicant has to be a super programmer and super analyst combined to meet typical job requirements. The use of this policy is probably geared to the illusion of receiving "more bang for the buck" from new employees.

Fallacy 3: The qualified candidate must closely meet the "experience" requirements of the job, often a super specialization of an application area.

Here we see a myopic failure to realize intelligent new hires can successfully apply classic systems principles and methods to new application areas. This experience blindness relegates job candidates to pigeon-hole boxes from which they can rarely move into new areas.

Fallacy 4: Good performance in programming work is a prerequisite to a systems analyst position.

Here is the tired fallacy of promoting a great technician to a position in management.

Analysis and programming are widely different job functions and require widely different kinds of personal interests, characteristics and abilities. The continued use of the programmer-to-analyst track forces people into preconceived molds.

Fallacy 5: When a person reaches 40, he is too old to perform well in technical DP-related jobs.

This has been disproved over and over again in practice – yet still lingers, continuing its negative influence on hiring otherwise perfectly acceptable candidates.

As long as these fallacies dominate DP hiring policy, "people problems" will dominate DP managers' attention, raising serious doubts about their effectiveness and stalling their acceptance into general management.

A Concerned Analyst.

Dear "Concerned":

Hiring technical specialists to fill current needs is a widely accepted practice, but it falls short in two important respects.

First, this narrow focus may be acceptable for positions in which the individual works in isolation, but they are rare in modern computer centers. As we all know, successful installation of complex applications demands considerable teamwork, communications, and other interrelationships among all those who participate in the system process. Yet these and other factors related to personal leadership are essentially ignored by recruiters for most organizations.

The Human Connection

Second, the narrow focus rarely produces candidates who are qualified for future DP management and supervisory positions. Coupled with the almost total void of effective DP management development programs, this has led to the severe shortage of real leadership we face today.

Are recruiters really that narrow? The July 19 issue of *Computerworld* contained 58 position announcement ads in 420 column-inches. In that entire space, only seven sentences made reference to interpersonal capabilities of candidates.

Just one advertiser was bold enough to declare the "ability to communicate (is) as important as a logical mind."

Wouldn't it be refreshing to read sentences such as these in industry ads for programmer/analysts:

"Candidates should submit a 2,500-word essay describing their professional goals and objectives and why they feel their efforts will be compatible with the goals and objectives of our company."

Or: "Applicants should prepare a two-hour management presentation of their approach toward DP systems design and development ... ."

Or: "Candidates should prepare and conduct a half-day seminar involving our systems analysis group . . ."

Readers are invited to write to Stone, c/o Computer Education International, Inc., Suite 222, 2233 Wisconsin Ave., Washington, D. C. 20007, outlining questions, issues or situations pertinent to human relations in the DP setting.

Letters should be no more than 350 words long and include the name, title, organization, and address of the sender, although that information will be withheld from publication if requested.

Structured Future Theme of Seminars

NEW YORK – Structured design and programming will be the theme when Jerry Weinberg and Ed Yourdon team up later this month to present one-day seminars entitled "The State of the Future: The Design Decade" in five cities across the continent.

The lecturers will be in New York, Washington, Toronto, Dallas and San Francisco from Sept. 20 through Sept. 24, according to Yourdon Inc., which is sponsoring the seminars.

Registration fee is $195, a spokeswoman added from the firm's offices at 1133 Avenue of the Americas, New York, N.Y. 10036.

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Ed Yourdon and Jerry Weinberg will be examining these and other questions at five one-day State-of-the-Future Conferences in cities across the country the week of September 20th (see box below for dates).

Both of these dynamic thinkers have some very strong views on the subject.

Views that have been tempered by ten years of experience as leaders of the "structured revolution."

Yourdon is the author of *Techniques of Program Structure and Design* and *How to Manage Structured Programming*. And co-author of *Structured Design* and *Structured Programming in COBOL*.

Weinberg is the author of *The Psychology of Computer Programming* and *An Introduction to General Systems Thinking*.

State-of-the-Future Conference Dates	
Washington	September 20th
New York	September 21st
Toronto	September 22nd
Dallas	September 23rd
San Francisco	September 24th

The conference will consist of four major presentations by Yourdon and Weinberg. There will be discussion periods after each session.

Each conference participant will receive a copy of Weinberg's *An Introduction to General Systems Thinking*, and Yourdon and Constantine's *Structured Design*.

Specifically, Jerry Weinberg will speak on *General Systems Design* — the discovery of the deep principles that will chart the course of future design. His second talk will revolve around the subject of *Responsive Design* — a philosophy of designing computer systems that adapt to the idiosyncrasies of people rather than having people adapt to the idiosyncrasies of the computer.

Ed Yourdon will speak about *Structured Design* — the application of general systems theory to the design of computer programs and systems. Coupling, cohesion and design strategies based on data flow and data structure will also be covered. Yourdon will also talk on the subject of *Evolutionary Design* — the concept of integrating the analysis, design and implementation of a computer system as a series of "top-down" versions.

If you wish to attend the State-of-the-Future Conference please fill out the coupon below. But, hurry. Reservations for this one-day trip into the future are limited.

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Systems Manager Warns:

Interview Requires Planning to be Effective

By Don Leavitt

Of the CW Staff

CLEVELAND – The interview should be the prime source of information or input to almost any problem systems people have been assigned to solve.

Unfortunately, however, if an interview is not well planned and then controlled, it may produce nothing of value, according to Albert Collard.

Writing one of the chapters in *Peopleware in Systems*, published by the Association for Systems Management (ASM), he noted that without pre-planning, much valuable time can be wasted. And, he added later, without debriefing afterwards, points made during the interview may be overlooked by the interviewer.

Planning for any particular interview should begin with a review of the company or department organization chart, corporate procedure manuals and job descriptions. The plan should include a statement of objectives and results to be expected, which will differ with the level of management to be interviewed, Collard noted.

The Human Connection

Systems manager for Eastern Airlines, he went on to say it is important to give the interviewee a time schedule. "Everyone's time is valuable and you're more likely to get 30 minutes of a senior executive's time if you have a plan that includes a time table."

Once into the meeting "the most important thing an interviewer can do . . . is listen." The interviewer should speak only to clarify a point, bring the discussion back to the subject or terminate the interview, he said.

"With a difficult interview, it may be necessary to prompt the interviewee with questions," Collard continued, "but again, remember that you are there to listen."

Note-taking may inhibit the interviewee's responsiveness, he warned, so the analyst should observe the reaction to the note-taking early in the interview and abandon it if it seems to be getting in the way.

Although many analysts like to have as good an idea of the current situation before an interview, "never be afraid of asking a 'dumb question,' because it often forces the interviewee to explain in detail and you may uncover information which, otherwise, you may never have been given."

It gives the interviewee an opportunity to demonstrate his expertise and "it keeps him talking," Collard said.

The "dumb question" approach is particularly useful when interviewing older clerical employees, he added. "If you do not completely understand what they are doing, ask them to describe it in detail. Persistence often pays off."

The analyst should frame questions to encourage more than "Yes" or "No" answers, Collard stressed, noting "How do you prepare a bill of lading?" is far more effective than "Is this the way you prepare a bill of lading?"

Ultimately, one of the best ways to get the interviewee involved is to ask something like "How do you suggest we improve the way we are doing this?" he continued.

But, he warned, it may be difficult getting people to volunteer their ideas of possible solutions in an organization where a suggestion award program exists. A "fully-documented solution to your problem [may be] sitting in a clerical worker's drawer waiting for the next suggestion award program," he said.

An important part of the training of systems analysts can be a debriefing session between the analyst and his manager shortly after an interview. The analyst should have time to document the interview, but the manager shouldn't wait too long for his review of what had been accomplished, Collard indicated.

At the debriefing, both the plan and the results of the interview should be discussed. The level of detail uncovered by the interview is important to analyze at this point, since it is a good clue as to the ability of the analyst to conduct an interview, he said.

People in Perspective

CLEVELAND – *Peopleware in Systems* is a soft-cover 85-page collection of articles by various authors, all focused on creating "working environments that encourage growth, achievement and recognition," according to the Association for Systems Management (ASM), which has published the book.

The 18 articles are divided into sections on managing, interviewing, motivating and training people. The book is available for $6.50 from ASM headquarters, 24587 Bagley Road, Cleveland, Ohio 44138.

Deltak Adds Program On Design Structure

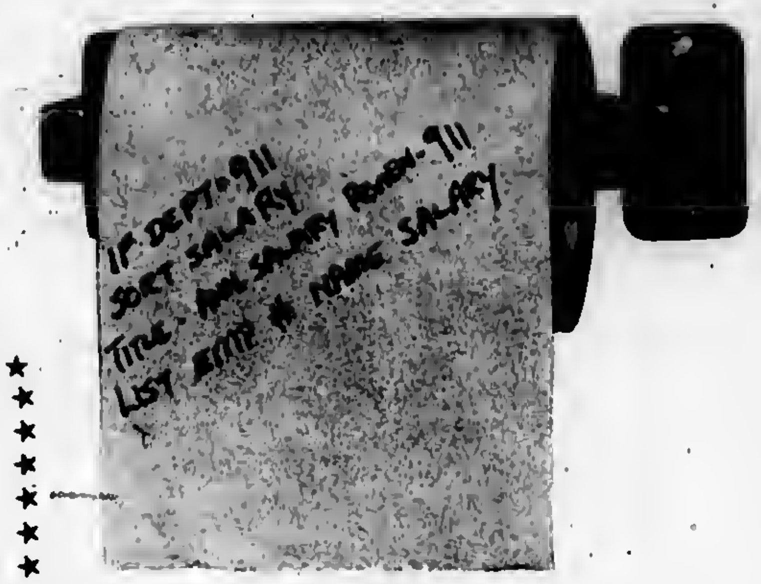
SCHILLER PARK, Ill. – Structured Design, a nine-course, video-based training program from Deltak Inc., fits logically with the firm's existing courses on structured programming, top-down design and programming team effectiveness, a spokesman asserted.

Developed with Larry L. Constantine, who has written books and lectured on the subject for several years, the series covers various aspects of the design phase of DP projects, from an introduction to the subject through a discussion of management considerations.

The courses are organized so that they can be used separately or as a whole program. Each course is estimated to take the typical student two to three hours.

Although Structured Design can be purchased, a Deltak spokesman expected most users to acquire it for limited periods of time under rental plans, which provide access to some 3,800 individual courses.

Deltak is at 9950 West Lawrence Ave., Schiller Park, Ill. 60176.



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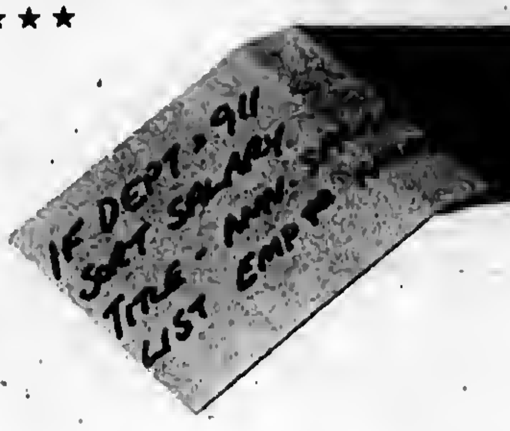

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In Early 1977

Seattle Bank to Become First User of Bell TNS

By Ronald A. Frank
Of the CW Staff

SEATTLE – The Seattle First National Bank will become the first user of Bell's Transaction Network Service (TNS) early in 1977 when a credit authorization and check validation net goes into operation.

The service will initially include Transaction III terminals supplied by Pacific Northwest Telephone Co. along with the necessary lines and a Bell 3A ESS switch.

TNS will handle inquiries initiated by retail subscribers and messages will be sent to the Honeywell Information Systems mainframe at the Seattle First DP center, according to William Larson, the bank's vice-president.

In a typical operation, a credit authorization inquiry would be initiated at a Transaction III terminal when the salesperson passes a customer's credit card through the terminal's magnetic stripe reader. The key pad on the terminal would then be used to enter the amount of the transaction.

In addition, another key pad available to the customer would be used by the shopper to enter a Personal Identification Number (PIN). Approval or disapproval of the transaction will be displayed on the 8-digit LED read out of the terminal.

'Very Aware' of Privacy

A transaction cannot be entered into the system unless both a card number and PIN number are entered, Larson said.

He stressed that the service will be "very aware" of the customer's privacy and only information pertaining directly to the store transaction will be available at the retailer's terminal. There is no way that the retailer would be able to get a customer's current bank balance, he said.

Transaction III terminals will be polled by the Bell switch and messages will be transmitted from the Bell terminals at 1,200 bit/sec. Non-Bell terminals will probably be added to the network as the need arises, Larson said.

Seattle First wants to expand the system to make it available to other banks and charge plans. The system is not designed to serve only the bank's customers, he said.

Although the first service will start in the greater Seattle area, it will be a statewide network and other commercial banks are actively being sought to participate. It has not yet been determined how several banks will share the costs of TNS, but the goal is that a retailer will be able to access multiple credit data bases and DP centers from only one terminal, Larson said.

Facilities Available

A major advantage for the bank is that Bell will provide terminals, lines and switching at a tariffed price. If the bank configured its own network, several million dollars would be involved and several vendors would be included, he said. And there is very little start-up time since Bell has the necessary facilities already available, he added.

Transmissions between the switch and the bank's front-end processor will be either 4,800 or 9,600 bit/sec. Message format will be similar to the IBM 2780 using a binary synchronous line contention mode, a Bell spokesman said.

At present the network will be used only for transactions from terminals in retail stores, but other options exist. Since the service is part of the phone network, it is possible for customers to access retail stores from home Touch-Tone phones, Larson said.

In 1973 a subsidiary of First Seattle offered a service that provided shopping and bill paying to telephone subscribers. The service was dropped after six months.

Larson did not give a figure on how much the bank will pay for TNS. But the experimental tariff filed by Pacific Northwest Telephone includes $35/mo per Transaction III terminal and $22.50/mo for each access line.

In addition Bell will be providing a four-wire facility with either 208 or 209 data sets between the TNS switch in Seattle and the Honeywell CPU at the bank's DP center. A typical transaction will cost about one cent with exact price based on characters transmitted.

Each Transaction III will be connected to a Data Station Selector over a two-wire facility. Connection between the selectors and the switch will be over four-wire circuits, the Bell spokesman said.

The 3A switch is now being installed at a central office in Seattle and the first test transactions will begin soon, the spokesman said.

Short-Haul Line Adapters Reduce Data Costs

By LeVern Whitt
Special to Computerworld

SPRINGFIELD, Ill. – A communications technical control center, of this state's Department of General Services here, provides teleprocessing service for terminals in nearly all state agencies by utilizing short-haul line adapters.

One of the tasks of the Division of Telecommunications is providing data communications for the more than 300 terminals connected to the center. These include IBM 3270 CRTs, remote job entry terminals and 360/20 workstations.

By early 1974, data communications costs had risen markedly with the increase in terminal utilization, and the state was determined to find a less expensive way to connect local users to the system.

It seemed intuitively wrong to be using conventional long-haul modems to connect the many users within five miles of the center, but there also seemed to be no solution. We'd seen "line drivers" but they required end-to-end DC continuity – a characteristic we could not reliably obtain over Bell-type private-line facilities.

The search led to limited distance data sets, or line adapters, from Gandalf, Inc. of Wheeling, Ill.

These units offered synchronous operation at 9.6K bit/sec up to 5.5 mi. (further at slower speeds) and did not require DC continuity. These short haul units had standard EIA interfaces and "looked like" conventional modems to both the user and the computer.

This equipment seemed to fill the needs.

Point-to-Point Applications

In May 1974, the first Gandalf LDS 209's were received and put to work on point-to-point applications at 9.6K bit/sec at distances up to 5 mi. The evaluation was watched with great interest and much criticism was offered – "it's too small, too light, it can't be reliable."

At one point, Gandalf seriously considered putting the adapters in larger, heavier cabinets just to quell the critics.

"The critics were only partly right – it is small and light. At the Ill. DP center we now have in one rack what used to require five racks to hold. And with this shelf-mounted configuration with one data set per plug-in printed circuit card,

(Continued on Page 32)

IBM 3777 Helps Drake Cakes Save

WAYNE, N.J. – Drake Bakeries has become the first user of the IBM 3777 remote batch terminal and, in the process, it has acquired increased capabilities at less cost.

The 3777 provides the main link between the firm's facility here and the corporate DP center of Borden, Inc. in Columbus, Ohio.

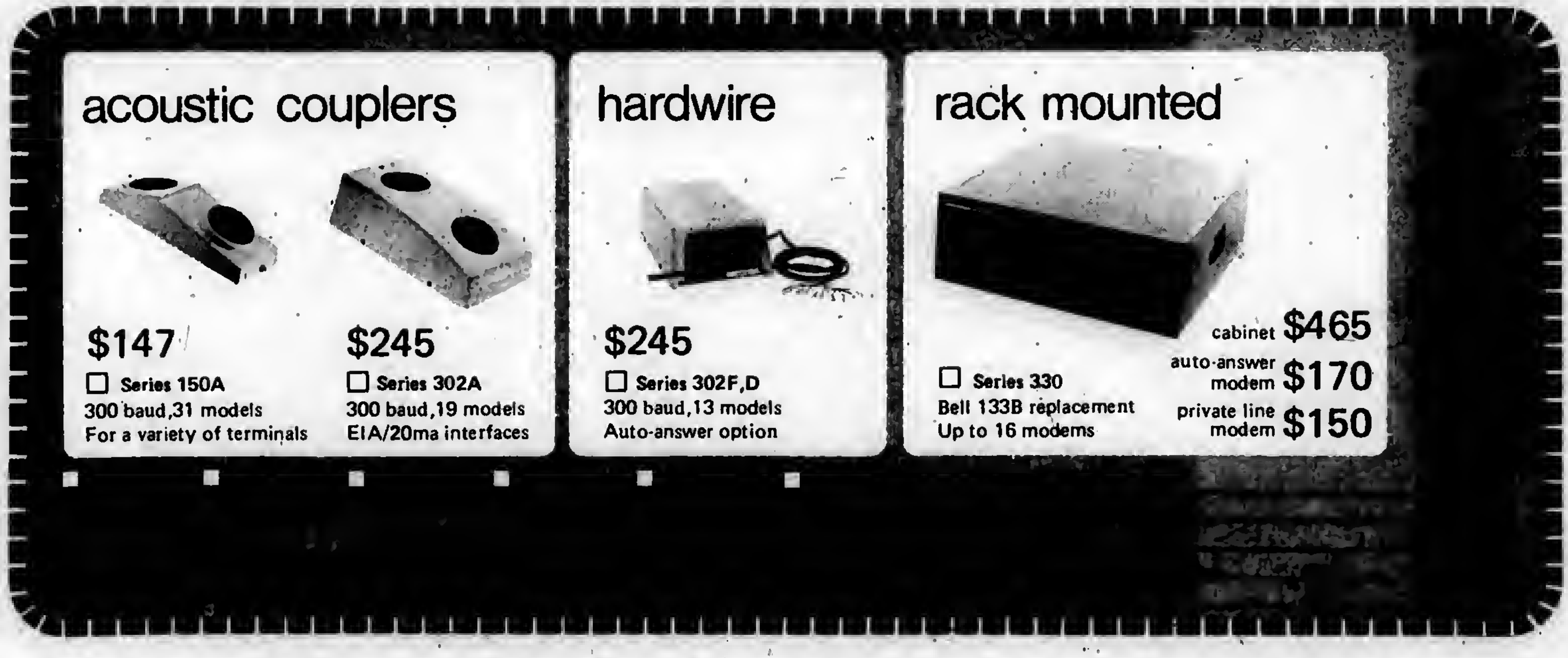
Drake, a Borden subsidiary, uses a 370/158 in Columbus for all its administrative and other DP needs, according to Joseph Gambino, DP manager for Drake.

The 3777 will operate at 9,600 bit/sec over AT&T private lines. The high-print speed provides an output capability that is comparable to having a 1403 CPU printer, Gambino said. The 3777 will operate in both local mode for data input and binary synchronous mode for transmissions to the Model 158.

Drake also has an IBM 3776 which has many of the capabilities of the 3777, but with slower print speeds. Together both terminals replace an IBM 3780 terminal which costs about $1,600/mo. The newer terminals cost "several hundred dollars less" per month with faster operation, Gambino said.

Data is stored on a diskette in the 3777 and transmissions are sent several times per day using Bell 209 data sets. The Model 158 operates under OS/VS and uses a communications access method called Rtam, which Gambino said was an inhouse modified version of IBM's Vtam.

Eventually the 3776 and 3777 will transmit data using IBM Synchronous Data Link Control to communicate with the 370 CPU. The terminals eliminate the need for card input on the 3780.



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Short-Haul Line Adapters Minimize Illinois Technical Center's Data Costs

(Continued from Page 31)

we can isolate and replace a faulty unit in only a few minutes where it used to take hours using common carrier modem equipment," Mike Johnson, data systems engineering manager, said.

By the end of 1974, studies, tests and tariff discussions with Ill. Bell and Western Union were completed and a minor modification was made to the transmitters to ensure compliance with energy requirements of AT&T Pub. 43401 for metallic wire circuits. The center now uses over 140 of the limited distance data sets.

Satisfied with Performance

Johnson is satisfied with both performance and reliability. "We've found the equipment very serviceable and have experienced a minimum of down time. Perhaps the best testimonial is the fact that the state agency, which was our severest critic, is now a satisfied user," he said.

"We're also operating several circuits at 19.2K bit/sec using the 300 series equipment and still others at 50 kbit/sec with 250 series, both types from Gandalf," he added.

Well-Adapted Hardware

The hardware is well adapted to multipoint systems and several are operating at 7.2K and 9.6K bit/sec. The ability to bridge numerous drops using digital, rather than analog, techniques has allowed terminal counts as high as 20 devices per data set.

The switching capability, inherent in the design, lets the state reconfigure networks quickly or disable defective drops without affecting other users and without common carrier intervention.

Nobody's complaining about the economics either. As an alternative to conventional modems, Gandalf's equipment is saving the state more than $250,000/year in communications modem costs alone. The line adapters cost about $50/mo compared to an average of $190/mo for a Bell modem.

Experience indicates that not all installations may proceed as smoothly as ours. Prospective users should note that the use of this type of equipment may require closer than usual liaison with the local telephone company to obtain the required unloaded metallic circuits.

Carriers in some areas may not yet be familiar with this hardware or the tariff structure. Physical obstacles may also prevent an otherwise ideal application although the following case is probably exceptional.

Short-Haul Units Desirable

In this instance, it was clearly desirable to use short-haul equipment between two buildings only one-quarter mile apart in Chicago. But the concrete jungle of expressways between these urban buildings made it economically unfeasible to install the necessary metallic circuits (and the short-haul hardware won't work over the already-in-place common carrier circuits). It was an unusual case, but it underlines the necessity of careful planning.

Universities have seen large growth in the application of limited distance equipment. With their high use of teleprinter terminals and relative ease of installation of private cables on campus, they have been able to take full advantage of the economy offered by this technology.

Some carriers will provide metallic circuits, but the state uses conventional type 3002 facilities.

What we're really waiting for, of course, is the same kind of development effort to bring us the equivalent cost, size and weight benefits in long-haul hardware.

LeVern Whitt is manager of the Division of Telecommunications of the Ill. Department of General Services.

Hand-Held Monitor Debuts

OGDENSBURG, N.Y. – A hand-held instrument designed to monitor data communications systems to RS232C specifications has been introduced by Goodwood Data Systems here.

The Goodwood 232 monitor provides a method of checking system operation and enables problems to be identified and located when breakdowns occur.

The Model 232 indicates the condition of the data communications system under test, permits direct access to individual signal lines and allows operation of the system terminal in the echo mode.

The unit continuously displays DRT, CD, DSR, CTS, RTS, RD, TD and TEST INDICATOR on eight LEDs. Pin connections are available for oscilloscope monitoring.

Operation may be from the line, batteries or rechargeable batteries. The Model 232 costs $180 from Goodwood Data Systems, Box 768, Ogdensburg, N.Y. 13669.

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[illegible]
Right [illegible]

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intertel

Furniture Co. Cuts Order Entry Time Via Terminals

MEMPHIS, Tenn. – A furniture manufacturer headquartered here developed a computerized system of order entry utilizing communications terminals to reduce order entry time.

Memphis Furniture Manufacturing Co. produces two lines of furniture: wooden bedroom furniture, or case goods, and upholstered furniture.

One of Memphis Furniture's major customers is a very large retail chain. Hand written orders from this customer's outlets used to require about ten-days time in the mail and in office processing. Upon their receipt, the orders had to be rewritten, encoded and keypunched.

This procedure has been completely changed and enhanced by the computer program, which Incorporates telecommunications, according to a spokesman.

Orders are now written by furniture department heads at the chain's retail outlets, encoded along with others on a Teletype Corp. Model 33/4210 terminal and transmitted at 120 char./sec to a central switching computer system in Chicago, he said.

Memphis Furniture uses a Mitron Systems Corp. MDRS-9 terminal to poll the communications computer and collect its orders. The incoming traffic is processed on Memphis Furniture's Burroughs Corp. B2700 computer.

Time Saved

Justification for the communications terminal, according to the spokesman, includes a savings of keypunch operator time at Memphis and at another company facility. Order entry time from customer to factory was reduced from ten days to one, he said.

The computer program developed by Memphis Furniture checks the orders, verifies customer and product numbers, assigns prices and extrapolates raw material requirements. Exception messages are created for imperfect orders, he added.

An order list is made for sales supervision. The sales department compares this listing with one made of the unprocessed incoming order traffic, which the terminal prepares by transmitting to a locally coupled Teletype printer.

Portable Tester Debugs Programs

PARAMUS, N.J. – A portable computer terminal that provides a method of testing communication systems and debugging programs has been developed by Computer Transceiver Systems, Inc. here.

Designated the Execuport Model 380, Troubleshooter, the unit functions as a standard portable terminal and has an operator switchable character set that allows the printing of normal nonprint characters such as device control codes, vertical and horizontal tabs, etc., according to a spokesman.

Standard models operate on Ascii code, but models can be supplied for use with APL, Baudot or IBM Correspondence code, he said.

Terminal Transactions

The Troubleshooter receives and prints a continuous data stream at speeds up to 30 char./sec, he noted.

Operations normally performed upon receipt of a nonprint character such as 'carriage return' or 'line feed' are not executed. Instead a special symbol is printed to provide a graphic record of the data stream.

Unconditional Printing

Printing takes place unconditionally from column 1 to column 80, he stated. After column 80 has been printed, an automatic line feed carriage return sequence is executed. Internal buffering prevents the loss of any data because of carriage return.

Program debugging often requires a memory dump to diagnose programs containing various non-printing characters, he said. The Execuport 380 provides a debugging method and hard copy printout that can be reviewed at any time.

Its portability allows it to be used in any remote location with telephone service, the spokesman noted.

Compatibility

The Execuport 380 is compatible with paper-tape and magnetic-tape memory units, most other peripheral equipment and all major minicomputers, he said.

It can be interfaced with peripherals by means of RS-232 connections at the rear of the unit.

The unit includes built-in acoustic coupler compatible with AT&T 103 series data sets, a data access connector or the RS-232 interface connector.

The 380 costs $3,070 with 30 day delivery, he added from Computer Transceiver Systems, Inc., E. 66 Midland Ave., Paramus, N.J. 07652.

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Real-Time line level monitor	Yes
Remote site assistance required	No
Meters, oscilloscopes required	No
RESTORAL	
Bypass line failures	Yes
All automatic at remote sites	Yes
Dial backup at all speeds 1200 baud-9600 bps	Yes
On-line spare modem	Yes
OTHER FEATURES	
Secondary Channel, simultaneous with data	Yes
Port Sharing	Yes
Modem Sharing	Yes
Bridging, analog and digital	Yes

Allows Concurrent Communications

Datapoint Announces Enhanced Intelligent Terminal

SAN ANTONIO, Texas – Datapoint Corp. has introduced both an upward extension to its intelligent terminal product line and a complimentary software package allowing concurrent communications with intelligent data entry.

The Datapoint 1150 intelligent terminal is said to offer increased memory, enhanced system diagnostics and memory test facilities over previous members of its product line.

In addition, the 1150 enables users to implement a real-time dispersed DP system through the utilization of Datapoint's Multilink software capabilities, the company said.

The 1150 system contains a processor, keyboard, CRT display and from two to four diskette drives, it said, adding the terminal system can be used with any of Datapoint's printers, communications adapters or tape drives.

It features a 41-key alphanumeric keyboard with an 11-key numeric pad, plus five system control keys. The 1150's CRT screen is a 7-in. by 3-1/2-in. viewing area allowing 960, 5 by 7 dot matrix characters displayed in an 80-character by 12-line format, according to a company spokeswoman.

User memory space includes 24K bytes with an additional 4K bytes of system read-only memory (ROM). The primary function of the ROM, Datapoint said, is to automatically load the disk operating system from the diskette.

The ROM also contains a debugging facility, system test, memory test and a diskette alignment and verification facility to maintain the hardware integrity of the system, it added.

The 1150 processor features Datapoint's 5500 instruction set with memory address indexing and basing capabilities; segmented and protected memory; double precision arithmetic; 16 registers, multiple byte I/O transfers; state saving and restoring; and privileged instructions, the company said.

An 1150 with two diskette drives sells for $14,480 and leases for $399/mo on a three-year lease, including maintenance, in most metropolitan areas, a spokesman said.

With four diskette drives, capable of storing about 1M bytes of data, the 1150 costs $15,680, he said.

Datapoint's Multilink communications software is said to allow the Model 1150 terminals along a multidrop line to perform local processing tasks such as data entry and report generation.

Software-programmed, switch-selectable transmission speeds from 1,200 bit/sec to 9,600 bit/sec can be obtained with the Multilink software, although higher transmission rates can be achieved using a programmable modem from Datapoint, according to the spokesman.

Multilink currently supports IBM 3770 batch/inquiry terminal emulation. Future releases will include Burroughs Corp., Honeywell Information Systems and Univac Corp. line handlers, the company said.

Multilink on an 1150 system allows concurrent communications or printing with intelligent data entry by allowing two Databus programs to run concurrently. The Datapoint master program typically is used for intelligent data entry while the utility program is used for communications or print spooling.

In a network controlled by a host computer, a Multilink system can access both its own local data base and the host computer's data base, Datapoint said.

The Multilink software package, documentation and the disk operating system costs about $100, the spokeswoman said. The communications adapter needed to effect real-time communications costs $1,500 and includes the interface and asynchronous modem, she added.

Other Datapoint languages will also run on the 1150 terminal system and are similarly priced, the spokeswoman said from 9725 Datapoint Drive, San Antonio, Texas 78284.

Graphics Display System Does Automatic Block Transfers

IRVINE, Calif. – Genisco Computers has brought out a user-programmable graphics display system which reportedly forms automatic block transfers via direct memory access.

The company's basic GCT-3000 system offers a 256-word MOS random-access memory (RAM) for graphics refresh with an access time of 50 nsec, a company spokesman noted.

A 2K-byte program store contained in the GCT-3011 programmable graphic processor is said to provide 47 mnemonic instructions for graphics manipulation.

Range of Resolutions

In addition, the typical GCT-3000 system includes a range of resolutions from 256- by 256 bits to 1,024- by 1,204 bits, with a bit-map-type refresh expandable from 1- to 16 bits per picture element, the company said.

It also includes a video control module that generates synchronization signals for the graphics monitors and, in the refresh mode, accesses data from the refresh planes for display, it added.

Interface modules are available for a variety of CPUs, although the standard system is intended for interface to a Data General Corp. Nova-type computer, according to the spokesman. The interface is a 15-bit parallel interface for direct memory access to the CPU, he added.

Array of Options

Options for the GCT-3000 graphics display system include a full Ascii keyboard; with 16 alphanumeric function keys and RS-232 interface, additional memory; video lookup table; intelligent cursor; multiple monitors; and zoom and scroll functions, the company said.

The basic GCT-3000 system costs $9,500 and the optional Ascii keyboard costs $1,500, although system prices for a "typical configuration" range up to $50,000, the spokesman noted.

Genisco Computers can be reached at 17805-D Sky Park Circle Drive, Irvine, Calif. 92714.

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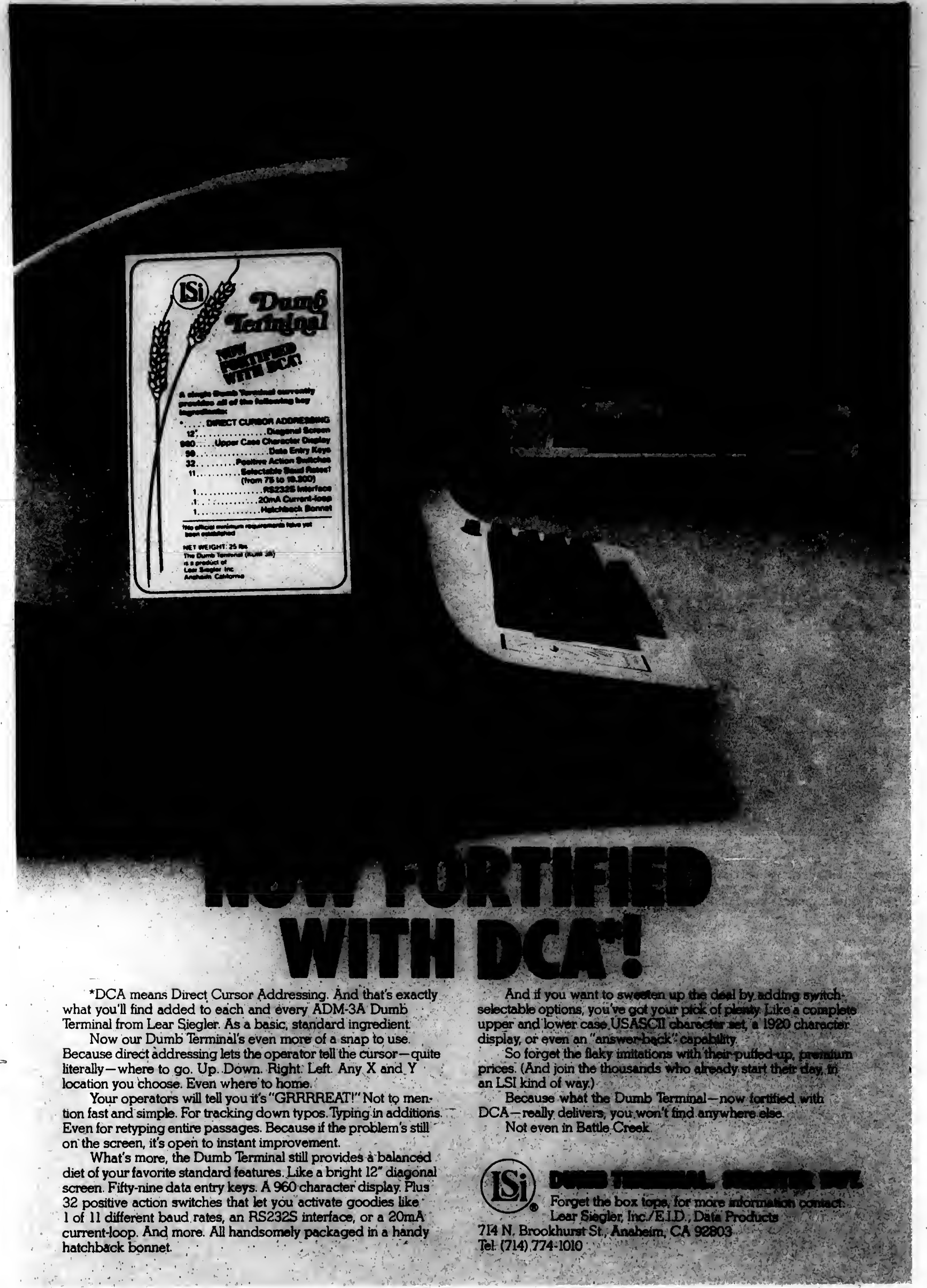
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Two Banks Speed Lock Box Operations With Terminals

NEW YORK – A terminal/data transmission system is helping Manufacturers Hanover Trust and Chemical Bank to optimize lock box operations.

They are two of a number of banks that are presently employing electronic means for handling customers' lock box operations.

Chemical Bank provides lock box services to some active 800 customers and handles a volume of about two million items. The bank's accounts range from relatively few payments of six-figure amounts to thousands of payments of less than $50. Payments processed for just 15 customers provide about 45% of the total volume the bank handles.

Contents of each payment are first checked to determine whether or not the checks are properly made out, dated and signed and agree in amounts with enclosed stubs, notices or correspondence. The checks are then put through a machine that endorses them and makes photocopies for transmittal with accompanying documents to customers and through a magnetic ink character recognition (Micr) machine for imprinting. The original checks are then tallied and deposited to the customers' accounts.

An operator at the Chemical Bank notifies a customer that taped data for its lock box daily logging will be transmitted.

To expedite daily updating of accounts receivable records, Chemical transfers payment data to magnetic tapes at three of its Mohawk Data Sciences (MDS) terminals. Tapes are then delivered to its three or four local customers, while most of the captured data is transmitted via long-line telephone, usually by appointment, after normal business hours.

As part of its services for some customers, the bank receives taped data transmissions from several other lock box locations and combines all such input into a single tape summarizing all the day's payment transactions. The pooled data is then transmitted via an MDS terminal to the customers' main computers.

According to John Olson, of Chemical's financial systems department, Electronic Funds Transfer (EFT), of which lock box operations are but a small part, is just starting to come of age. National Data Corporation, which clears transfers from checking account directly to checking account, has at present as many as 200 member banks, he noted.

At Manufacturers Hanover, an MDS 2400 data system has recently been installed for 24-hour data input work, mainly for lock box work, but with the capability to be extended to other data transmittal demands.

The Mohawk system at the bank utilizes both a 7-track and a 9-track tape drive and is compatible with the bank's main computer.

"This enables us to increase our services to our customers," Prestipino said. "For one thing, the equipment allows us to communicate directly with our customers' computers."

According to Assistant Vice President Nicholas Siragusa, manager of the bank's data entry department, there are currently 1,500 lock box transactions totaling $7.5 million transmitted daily to lock box customers.

Deposit Concentration operates for bank customers with large numbers of branches and provides an efficient method of concentrating funds from local bank accounts into one concentration account.

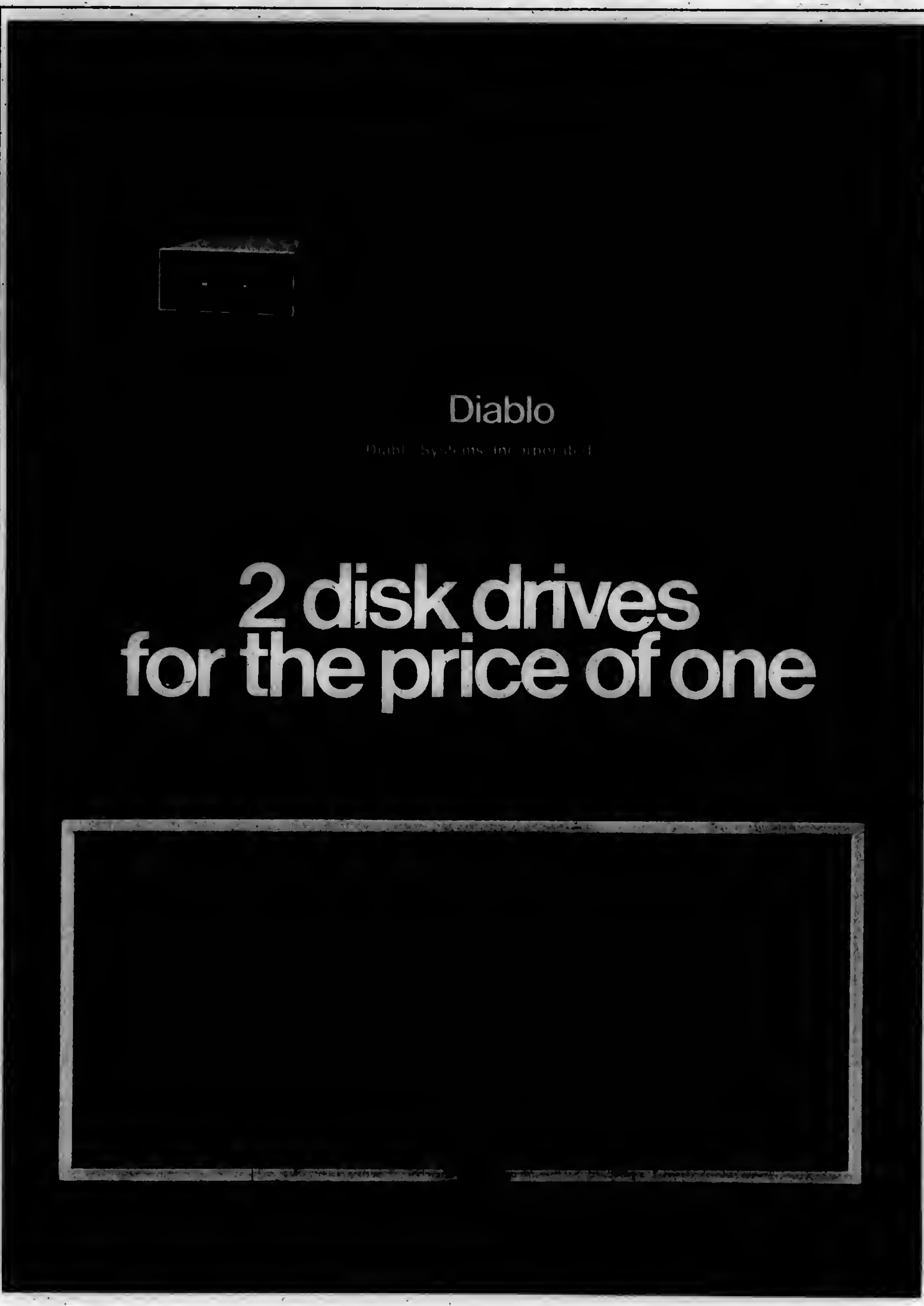
As outlined by Saul Jones, officer-in-charge of customer service for lock box and deposit concentration, daily deposits are made in local banks and then reported to service bureaus that in turn transmit the deposit information via a Mohawk terminal.

A master file is kept at Manufacturers Hanover Trust for each client so that Manufacturers Hanover in New York, can, upon receipt of deposit information, produce a check for each local deposit and control reports showing all deposits as well as the net deposit total for each client. The checks are deposited to the customer's concentration account. A daily transaction customer information tape is transmitted back to the customer's central office.

At present, the deposit concentration system at Manufacturers Hanover is serving 40 customers, handling 700 checks daily for a daily total of $51 million.

Apart from the speed of taped data transmission and the convenience of using common telephone lines of WATS service, magnetic tape provides substantial savings on data processing

(Continued on Page 40)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Uses Microprocessor Logic

Logabax Terminal Offers 'Universal' Communications

LOS ANGELES – A programmable interactive terminal that offers a 180 char./sec print speed and a "universal" communications capability has been introduced by Logabax S.A.

Designated the LX1010, the terminal utilizes microprocessor logic that reportedly allows it to talk in any existing protocol, code or mode.

It can be used as a private line polled device, emulating a 2740 Model II; it can be used as an Ascii-compatible time-sharing device; it can be used as a 2741, with or without APL; or it can emulate an IBM 3776 terminal operating under IBM's Synchronous Data Link Control, a spokesman said.

The LX1010 will be available for 30- to 60-day deliveries beginning this fall. It will lease for approximately $200/mo, including maintenance, or it can be purchased for about $6,000.

The LX1010 reportedly can emulate any protocol, using standard off-the-shelf program modules.

Users can employ Ascii, BCD, correspondence or other character sets and transmit data either synchronously or asynchronously at rates ranging from 75- to 4,800 bit/sec, in full duplex, half duplex or echoplex modes, the spokesman said.

Among the features of the LX1010 are:

- A microprocessor for program and data support.
- A standard print speed of 180 char./sec with an optional speed of 140 char./sec.
- A nine-needle matrix print head, which permits users to underscore information for emphasis, to use extended print spacing for reports printing or to use slanted or italicized printing for emphasis.
- Switch-selectable variation of the number of lines per inch – either six or eight line/in., to maintain compatibility with other systems.
- A programmable keyboard that permits layout of the standard 53 alphabetical and numeric/symbolic keys anywhere.
- A standard 10-key cluster that allows a choice of data entry formats and provides a relative and an actual print position indicator as well as either a manual or programmable tabulation feature.
- A standard set of 12 prerecorded message keys for use with specific functions to eliminate repetitive typing.

Logabax S.A. is at 10889 Wilshire Boulevard, Los Angeles, Calif. 90024.

GTE Lenkurt Has DDS Interface

SAN CARLOS, Calif. – GTE Lenkurt, Inc. has a digital data system local loop unit designed to provide the interface between terminal equipment and AT&T's Dataphone Digital Service (DDS) network.

The 1500A service unit is said to replace the customary data modem at the subscriber site and process a signal for entry into the DDS hierarchy at the local loop level.

DDS loop signals are converted to data and control signals which, depending on the data rate, conform to EIA or CCITT specifications.

Four L500A arrangements are available to match the existing 2,400-, 4,800- and 9,600 bit/sec and 56 kbit/sec DDS line speeds in accordance with industry standards, a spokesman noted.

The device provides equalization to compensate for varying loop lengths and cable gauges; network protection; and built-in test facilities to differentiate between DDS and terminal failures, he added.

GTE Lenkurt can be reached at Department C720, 1105 County Road, San Carlos, Calif. 94070.

Two Banks Expedite Lock Box Operations

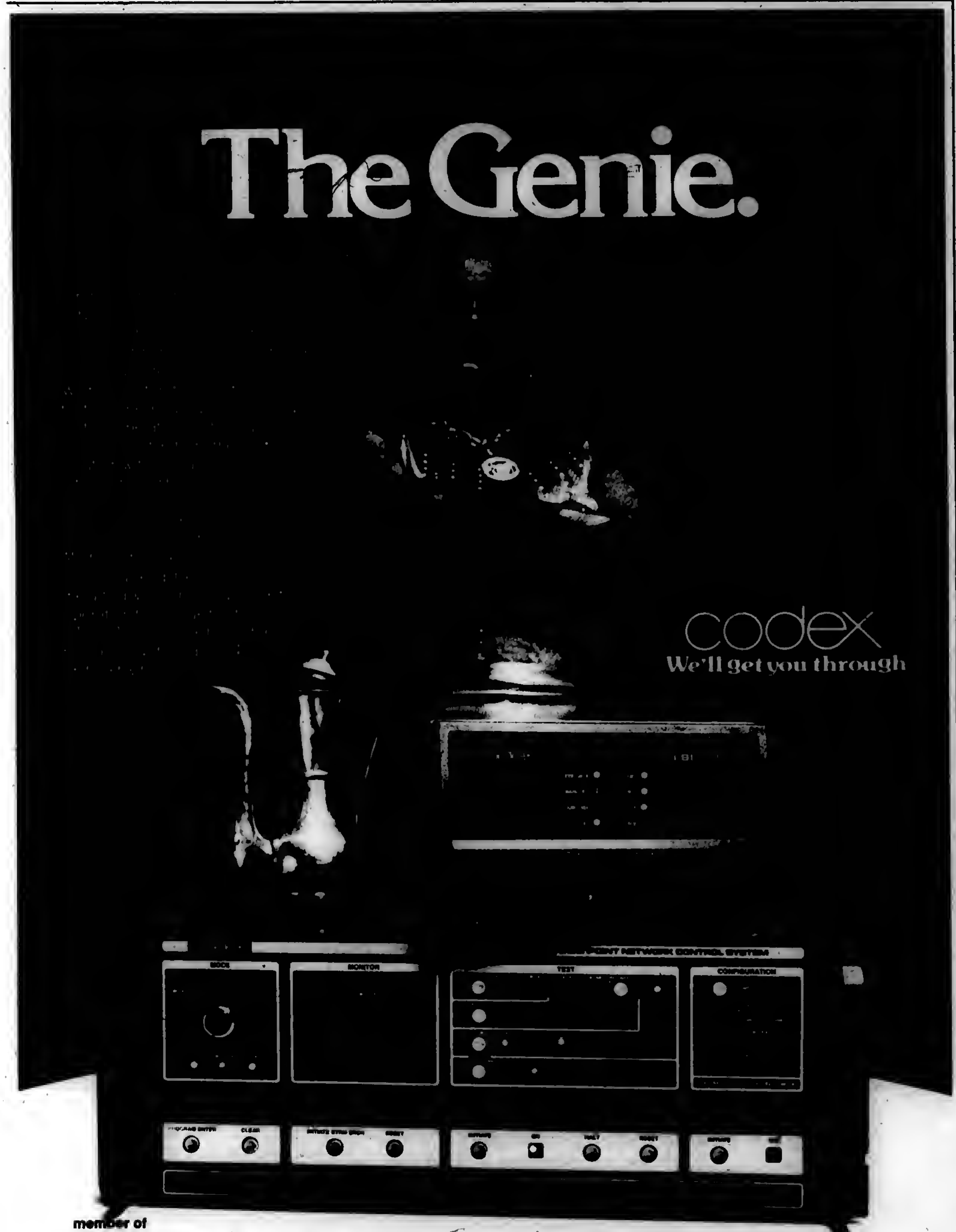
(Continued from Page 39)

costs.

Because electronically captured data can be applied to the computer in its original form, key punch operations and verification of punch cards can be eliminated.

In many cases, data input is further simplified by the use of return stubs, or other specially prepared documents that can be optically or magnetically scanned, in place of keying the data manually.

Equipment and operating costs for receiving transmission of data from lock box collection centers are quite low compared to alternate systems of handling and offer customers immediate use of detailed deposit information.



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SYSTEMS&PERIPHERALS

CW Survey Shows

Amdahl Users Unconcerned About Future IBM Moves

By Toni Wiseman
Of the CW Staff

Amdahl users seem totally unperturbed by speculation that IBM might incorporate more software into its hardware or develop a future operating system incompatible with Amdahl's.

Users believe such a move on IBM's part would hurt its own 360/370 users as much as it would Amdahl's, a recent survey of Amdahl users has shown.

Public Domain

The Amdahl 470V/6 operates primarily with software developed and placed in the public domain by IBM. Amdahl obtains, modifies, distributes and maintains four IBM operating systems, according to an Amdahl prospectus filed with the Securities Exchange Commission recentiy [CW, Aug. 30].

The firm plans to continue this policy as long as such programs are placed in the public domain or made available at reasonable fees, it said.

As for applications programming, users obtain, for a fee, applications software for the 470V/6 in the form of proprietary packages developed by IBM and others. This software is presently restricted to licensees.

Amdahl also expects its customers to be able to continue to obtain and use these applications programs and has no plans to develop such programs, the company said.

If IBM attempts to restrict the use of its future operating systems, however, Amdahl may have to develop more of its own operating system software.

Bob Mays, director of computer services and operstions at the Southwestern Ohio Regional Computer Center (Sworcc), said he really wasn't concerned about the possibility of incompatibility, at least not now.

Should the situation arise, "we'd have to make a decision about stsying with Amdahl or changing vendors for the next acquisition," he said. While he had heard IBM planned to build more software into its hardware, he did not feel this was imminent.

H. Russell, DP manager at MIT's Draper Laboratory, doesn't feel that the situation is apt to arise at all.

"I don't see how they could do it without hurting their own users. After all, if it's incompatible with Amdahl, it's also incompatible with 370/168 users," he stated.

"Even if they do introduce a new operating system, I can still get my work done unless they introduce some new peripheral I dearly want," he said, adding that was unlikely too.

Completely Independent

Dr. Robert Bartels, director of the computer center at the University of Michigan, isn't worried about a new IBM operating system because "we've been completely independent of the IBM operating system for more than 10 years. It doesn't frighten us a bit."

Michigan's operating system is its own Michigan Terminal System (MTS) which it converted, "without difficulty," from its old IBM 370/168 to the Amdahl 470V/6.

"We could conceivably face a problem five to six years hence, when and if we outgrow this machine, but we're confident Amdahl will not sit passively around and will act to counter any IBM move," he said.

National CSS, Inc. (NCSS) also has its own internally developed operating system, VP/CSS, so Michael J. Field, vice-president of data systems, does not expect any immediate problems from IBM changes.

"Further, I don't really see how, with a new series, IBM could essentially cut off its own operating system investment in the 370, or the 360 for that matter," he said.

Incompatibility

Field did not feel that the possibility of peripheral incompatibility would affect his shop too much "because if it were of sufficient interest to us we would develop the software to support it ourselves.

"If there were some particular hardware feature which we were not given specifications on, that would be a problem," Field admitted, "if programs to use that feature were only accessible through firmware, for instance."

The whole question will depend on how far IBM goes in burying its new features and how far it can afford to go in terms of locking out its current software investment, he said.

Amdahl has not discussed these possibilities with NCSS, Field said, but he surmised Amdahl sees a big enough market in the 370 replacement market.

"In fact, IBM might see some kind of backlash in coming out with a computer series which essentially turns its back on its current 370 market. Amdahl might pick up some there," he said.

Innovations Needed

Field added that "unless Amdahl comes out with some innovations, some new capabilities on its 470 series, in the next couple of years, its image will be such that it will not appear competitive on the marketplace, even though it may still make a good market in 370 replacements."

Dr. Dick Simmons, director of Texas A&M's computer center, was also among the optimistic Amdahl users.

"We understand Amdahl plans to stay compatible with IBM," he stated.

"In other words, if IBM came out with a new razzle dazzle system of some type, they would probably try to counter it in some way," he added. Future peripheral interfsce problems "are not a concern to us," Simmons noted.

"With the number of 168s in and the number being delivered, I would say the life of the [370] system, in my opinion, is going to last through the life of our Amdahl.

"In other words, we'll be able to hook enough peripherals to our Amdahl because you'll be able to hook them to a 168."

Simmons thinks IBM will probably, at a future date, "suck" part of the operating system into the hardware and control units into an internal part, "but I feel that any product follow-on that IBM has, like a 380 system, will put us in the same position as a 168 user – a position I don't mind being in.

"I just don't anticipate them doing anything where the 168 user will be able to take advantage of it and the Amdahl user will not," he concluded.

IBM 3800 Eases User's Report Burden

MILWAUKEE, Wis. – The F.W. Woolworth Co. has installed a high-speed printer to prepare reports that, if laid end-to-end, would stretch nearly 200 miles.

The IBM 3800 printing subsystem helps prepare a variety of reports for the 97-year old firm which operates nearly 1,800 Woolworth and Woolco Department Stores in the U.S. Woolworth is the first customer to install the system.

The non-impact printer combines laser and electrophotographic technologies and operates at speeds up to 13,360 lines/min. It accommodates a variety of character sizes and styles on any of 50 different sizes of continuous forms. The 3800 can also produce text and forms designs on plain paper.

The Central Accounting Office (CAO) performs the general accounting functions for all Woolworth and Woolco stores in the 50 states, the District of Columbia, Puerto Rico and the Virgin Islands. The office keeps detailed records of merchandise expenditures, sales and income on a store-by-store and region-by-region basis.

Using its two IBM 370/158s, the CAO processes vast volumes of material each month. This includes more than one million invoices from vendors and thousands of Woolworth and Woolco credit card statements which involve millions of sales transactions.

"High-speed printing is essential if key reports are to reach store managers on time," Patrick J. Nelis, division manager of DP, said. "This system helps us minimize the time required to print reports and prepare them for distribution."

Because the 3800 uses only single-part paper, the need to separate multi-parts forms and dispose of carbon-paper waste is eliminated. Every copy of a report is an original, meaning that each recipient gets a clear, readable document, he said. The 3800 is a non-impact printer, so Woolworth needs no impact printer supplies such as carbon paper and ribbons to operate it, he added.

The system helps conserve paper by printing smaller character sizes, so the company uses less paper to produce the same amount of text. Reports are now printed on smaller forms than before in a move toward standardization. This method requires about 40% less paper.

The laser is a key feature of the IBM 3800. The low-power laser "prints" character images on photoconductive surfaces covering a rotating drum. As the drum turns, dry, ink-like powder that adheres only to these images is applied to the photoconductor and transferred to paper to produce printed text.

The 3800 allows Woolworth the flexibility of creating its own forms, he said. Complex form designs on film negatives can be projected on the printing drum by a strobe light. Less complicated format designs, such as straight, intersecting or right-angle lines, can be formed by the laser. Both features help reduce costs by allowing use of less expensive plain paper and by minimizing the need to keep pre-printed forms in stock, he added.

Users of Voice Response Units Vocal in Praising the Systems

DELRAN, N.J. – Although small in number, users of voice response systems are generally "very well" satisfied with their equipment and with the technique in general, according to a recent report from Datapro Research Corp. here.

Datapro's voice response survey attracted replies from only 27 users – a fraction of the number normally received when the firm surveys users of other types of DP equipment.

But these 27 users were collectively handling over 132,000 calls per day from more than 20,000 terminals.

The average number of calls handled per day was 5,259 per system and 351 per line. The average number of voice response terminals served was 1103 per system and 74 per line.

Of the 27 respondents, 21 said the average length of a call on their systems was less than 1 minute, and 24 said the average response time to a request was in the range of 1 to 5 seconds.

The users were asked to assign ratings of excellent, good, fair or poor to each of nine specific aspects of their voice response systems. In the most revealing of these nine categories, overall satisfaction, 66% of the users assigned a rating of excellent, 30% good and 4% fair.

Among the 11 responding users of IBM voice response equipment, 10 rated their overall satisfaction as excellent and 1 called it good. Among 7 users of Periphonics equipment, overall satisfaction drew 4 excellent, 2 good, and 1 fair rating.

Five users of Wavetek equipment registered 3 excellent and 2 good ratings, and 4 users of voice response systems from other vendors accounted for 1 excellent and 3 good ratings in overall satisfaction.

Although the voice response users' overall level of satisfaction was high, the users were considerably more critical of their equipment vendors' performance in the areas of software, technical support and equipment maintenance, Datapro said.

CDC Tape Units Can Save 21%

MINNEAPOLIS – Users of IBM 3420 models 4, 6 and 8 tape drives can save up to 21% with compatible drives announced recently by Control Data Corp. (CDC), the firm claimed.

The series of 6250 bit/in. systems from CDC are 21% below the IBM purchase price snd 5% lower than the IBM price on a three year rental, CDC said.

The CDC 38032 systems include seven- and nine-track transports with recording densities of 556, 800, 1600 and 6250 bits/in. at tape speeds of 100, 150 or 200 in./sec, CDC added.

A CDC 38032 controller handles from one to eight 34202-4, -6 and -8 transports intermixed in any combination.

Optional features allow the connection of two, three or four controllers with combinations of up to eight or sixteen intermixed drives and a two-channel switch option is offered for installations with multiple IBM 360 or 370 computers.

Purchase and lease prices for the CDC 38032 controller are $34,100 or $682/mo on a three-year contract.

A 34202-4 transport can be purchased for $17,400 or leased for $363/mo. Purchase prices for model 6 and 8 transports are $20,500 and $23,950, respectively, and these units lease for $436/mo and $483/mo. Deliveries are scheduled for the first quarter of 1977, the firm said from Box 0, Minneapolis, Minn. 55440.

WBNC

BASF invented magnetic tape 40 years before Memorex broke their first glass.

Back in 1932, when Hoover was still president and radio was the big noise in home entertainment, BASF invented magnetic tape and the technology that made today's high-density data processing media possible. The state of the art has evolved considerably since then, and we're no longer alone in the magnetic media field. That's why, while we know we were first, we'd rather you know that we're the best. And we've put more effort into being the best than anyone else in the business. That's why we design and manufacture our own testing apparatus, and why we use up 75,000 miles of computer tape every year in our development department. Because at BASF, "good enough" just isn't good enough. We've been around for a long time . . . long enough to know that it's what we've done for you lately that counts. Ask our customers . . . most people who choose BASF make it their only choice. BASF Systems, Bedford, Massachusetts 01730.

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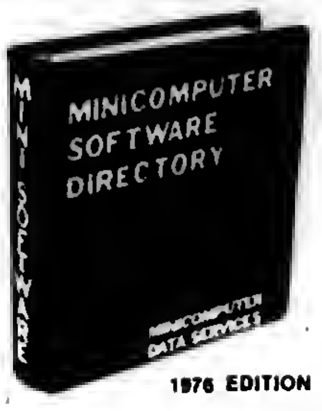

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System Joins the Pick and Shovel Gang To Help Classify Archeologists' Finds

EVANSTON, Ill. — Computer technology has joined the pick, shovel and drill to help Northwestern University archeologists at the largest excavation site in North America.

Archeologists working at the Koster site in southern Illinois rely on a Control Data Corp. (CDC) 6400 computer 300 miles away at Northwestern University here to keep track of their findings and even determine where to begin the next excavation.

In addition to information unearthed at the Koster site, pertinent data recovered from some 800 different archeological sites in the 2,800 square mile research area is entered through a terminal at the project's headquarters in Kampsville, Ill., for relay to the CDC computer.

At Northwestern's Vogelback Computing Center, the 6400 uses a university-developed data base program known as Remote Information Query System (RIQS) that is designed to handle the varied data of individual researchers.

RIQS not only catalogs the archeological data, but monitors the quality of it to safeguard against duplication, performs required analyses and provides printer or plotter output.

Benjamin Mittman, director of Northwestern's computing center, said the half-million items of information generated annually at the excavation sites would have considerably less value without a computerized storage and retrieval system.

From information entered on terminals at the excavation headquarters, the CDC computer built a file for each of the 800 sites.

Each file is structured to hold 145 items of information about the site and the excavation results. Site description includes name, location and size of the excavation, names of the archeologists involved, where the artifacts from the site are stored, and what has been photographed.

The survey information sent to the computer relates to soil conditions, evidence of cobbles and limestone (indicates cooking, pottery and tool making) and of animal bone (means there is favorable preservation at the site). Of the 145 slots of information storage for each site, 123 are for listing the artifacts uncovered — the data most important to archeological analyses.

To retrieve information from the file, either by site or classes of information, a user enters the assigned catalog number.

For example, suppose a student is interested in studying Early Archaic projectile points. He enters the catalog number assigned to that class of information and is presented a list of the sites where that particular projectile was uncovered.

Then, by entering the names of those sites, he can learn more about the projectiles, where they are stored and the archeologists involved in their excavation. What's more, Mittman said, researchers can utilize the system without being sophisticated programmers.

Colleges Handle DP Work By Mini/Mainframe Link

BOSTON — The Massachusetts State College System broke with traditional academic data processing techniques when it decided to send the instructional, research and administrative data of its 10 colleges to one central processor.

In operation since January 1975, the computer network of 11 Control Data Corp. (CDC) System 17 systems linked to a large-scale CDC Cyber 72 installed here has compiled an average uptime of 98% while processing a mix of 30,000 jobs monthly.

Each of the 10 campuses located throughout the state is equipped with a CDC System 17 computer. Another System 17 operates at the network center to control data traffic and for program development.

Originally the network was implemented in October 1973 with CDC 731 remote batch units at the campus sites. All but one have been replaced by the System 17s which offer some on-site processing through 32K to 64K memory and memory cycle times of 900 nsec and 600 nsec.

Leo Roomets, director of computing, said the decision to integrate administrative and instruction computing under one central processor came after research by a special committee and an outside consulting firm. The resulting plan, a five-volume, 2,000-page document included state-of-the-art concepts in systems design, teleprocessing and network organization.

From the beginning, plans included providing the colleges with the administrative and technical support necessary to meet all their data processing needs.

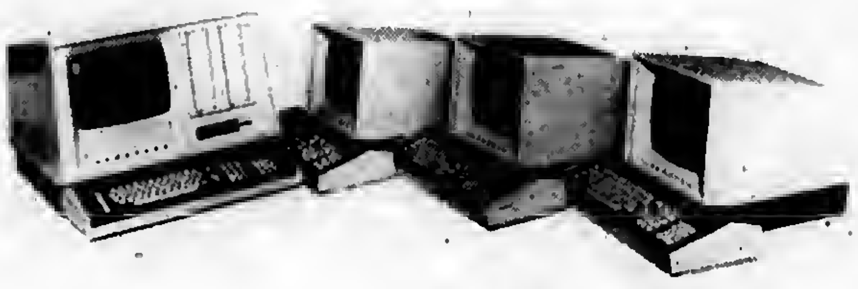
The network center supports a system and programming staff charged with the responsibility of maintaining and enhancing an integrated information system designed around linked data base structures for use in an on-line, real-time transaction-oriented environment.

For example, this allows students to apply at any three of the 10 colleges with the information stored on the Cyber 72. Admissions officials query visual display terminals in their offices for such information, determine if the applicant is to be accepted by that college, then instructs the system to generate the appropriate letter to the student. From this initial information, a student file is created for input of future data.

Other than handling traditional college administrative tasks such as budgets, student records, billing, grade reporting and payroll, the Cyber 72 also processes data from special administrative programs, such as the disposition of the Commonwealth's annual $11 million scholarship fund.

While administrative data processing for the 10 colleges naturally creates a considerable workload, instructional DP is also on the network.

During a typical month, 22,000 or 71% of the jobs processed are of an instructional nature. User statistics show that about 3,000 students and faculty use the computer network regularly.



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'Friendly' System Wakes Teachers Up in Indianapolis

INDIANAPOLIS, Ind. – A computer system is both friend and foe to teachers here.

The system at the Indianapolis Public Schools is so nice that it wishes "Happy Birthday" at the right time to each of the city's 8,173 school employees. On the other hand, it will also be responsible everyday for making 6 a.m. wakeup calls to scores of teachers who had been planning to sleep in.

Actually, those two jobs represent only about .5% of the 400-plus programs running on a Honeywell Model 66/10 computer system at school headquarters here, according to Jim Bethel, director of DP.

The routine applications include computer-assisted instruction, grade reporting, class scheduling, test scoring and racial-balance analysis. In addition, the computer handles a number of business programs, such as payroll, accounting, purchasing and salary projections.

Happy Birthday

But when an employee's birthday falls within the current pay period, the system is programmed to type a message on his check which says: "Happy Birthday. Check Your Driver's License."

The same application prompts the printing of other messages on bi-weekly checks of those not celebrating birthdays. The messages generally have an educational flavor – "Children have more need of models than of critics" and "Only the educated are free" are typical examples.

But a system is also under development for selecting substitute teachers. It is an automated procedure for identifying and evaluating substitute teachers on a daily basis.

"What the computer does is beyond the capabilities of the human mind," Bethel said. "Why, it took us four months alone to develop the algorithm to run this application and 15 months all told to put all the pieces of the system together. When we select a substitute teacher for a day, we don't want just a babysitter. Our goal is to find the best qualified individual for each assignment. The wrong teacher means a lost day for our students, and we're trying to eliminate lost days."

150 Marked Absent

Among 4,391 teachers in the school system, an average of nearly 150 per day may be out due to illness, personal business or for professional development purposes, Bethel stated.

The current system for selecting subs is all manual; a staff of three persons searches through hundreds of card files to find candidates for the missing regulars. The choices they make may depend on how much they can remember as they sort the files, what else is on their minds and maybe even how many cups of coffee they've had for breakfast.

What the computer application does is to make sure that a prescribed list of factors and priorities is taken into consideration before selections are made. There are a number of variables – the days and hours during which each substitute is available, what schools they prefer, their special capabilities, how school principals feel about them and a fair share of opportunities for all subs.

The computer also is programmed to select the same substitute each day in the event of the prolonged absence of a regular teacher; however, after 14 days, it selects a new sub so that the school system is not obliged to pay retroactive double or triple rates to teachers with 15 consecutive days of service.

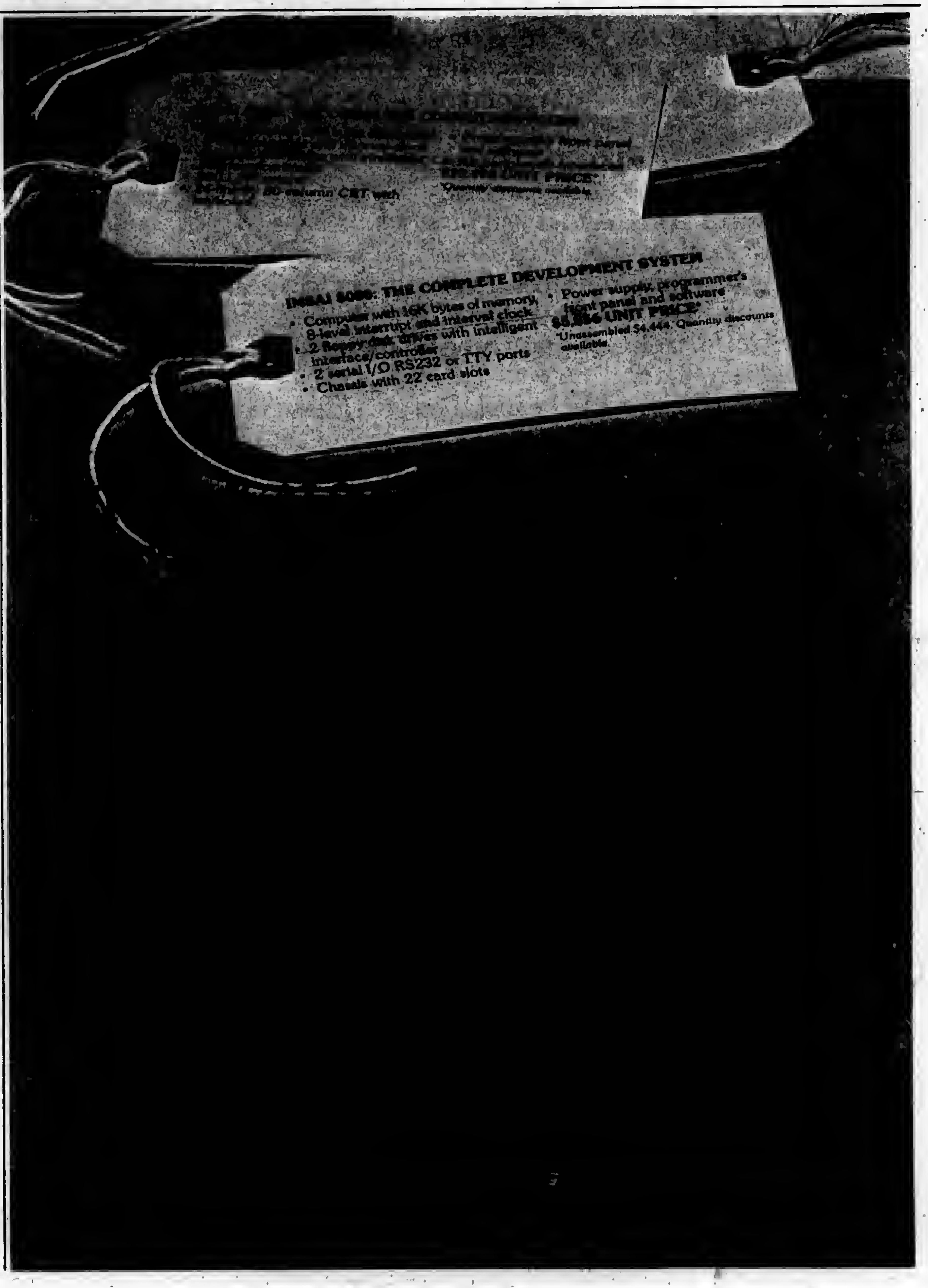
The process of finding the right substitute once the new application is ready will start early. Before dawn, absent teachers will be asked to call school headquarters. There, a voice-activated tape recorder will receive key information – the teacher's name, social security number, school, grade and reason for absence.

At 5:30 a.m., clerks will be on the scene to transfer data from the tape recorder to the computer. By 6 a.m. the system will begin making selections of substitutes. Two absence reports at a time will be displayed on the terminal screen, including the name and phone number of a recommended sub. Clerks will then place phone calls.

If a substitute is unavailable or unwilling to teach that day, the clerk enters a special code on the computer terminal to get information about another possibility.

"This system will be a rarity-maybe even unique-in the educational field," Bethel claimed. "Others have used computers to provide the information from which a substitute can be selected, but this system will actually make the selection."

Indianapolis Public Schools purchased its Honeywell Model 66/10 computer for $950,000 in mid-1975 and began immediately to develop the substitute teacher selection system. The computer system has 128K words of memory and 350 M char. of disk storage. Peripherals include a front-end processor, card reader and printer.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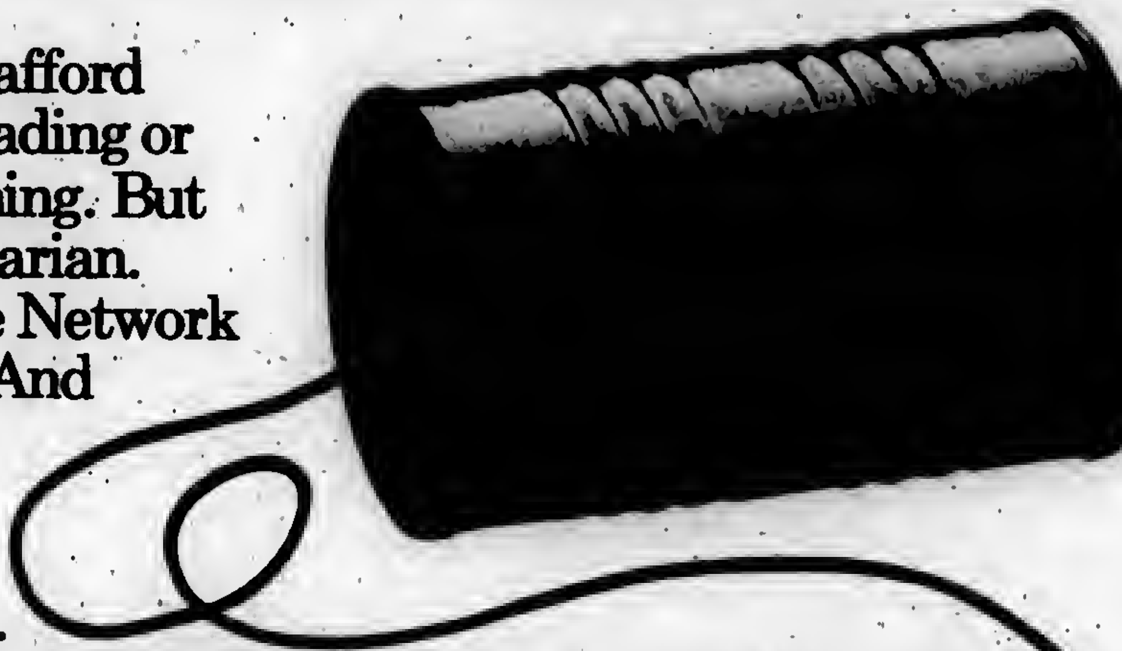

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On the 'Hot Dog Highway'

Oscar Mayer Chooses Central DP to Keep 'Em Moving

MADISON, Wis. – A total of 36,000 wieners an hour roll out of each of the famed "hot dog highways" at Oscar Mayer & Co. here – and a centralized computer system helps the firm keep track of them.

The firm has nine slaughtering and manufacturing plants now situated around the U.S. from Chicago to Los Angeles, from Pennsylvania to Texas. A network of 41 distribution centers has been set up to serve major metropolitan markets, and 750 sales representatives regularly call on almost every supermarket chain and independent food store in the country.

Size, growth and a decentralized operating structure pose some tough control problems for Oscar Mayer management, because in their industry livestock supply, product demand, manufacturing costs and selling prices can fluctuate daily.

Therefore, effective control is critical and to help, Oscar Mayer recently implemented a centralized computer systems approach.

The aim, according to William F. Shaffer Jr., group vice-president-finance, is to strengthen company-wide management control while retaining the advantages of local operating autonomy and local market responsiveness.

"Informed management is basic to effective control," Shaffer said. "This demands a central, readily-accessible source of current and pertinent company-wide information. This is what we are creating through centralization of computer processing here at corporate headquarters. We are fashioning a computer support system that we feel is far more compatible with today's operating and management requirements."

The first step in Oscar Mayer's centralization program was the installation (in August 1974) of an IBM 370/158, which began taking over numerous DP chores that had been handled by smaller computers at the individual plant locations. As the need for the self-contained plant computer systems was eliminated, they were replaced by remote job entry (RJE) terminals.

By early last year, the equipment conversion was completed, at a considerable savings to the company in reduced computer hardware costs, he said.

"In effect, the less expensive RJE terminals give the plants even greater data processing capability than they had before, because of the direct access RJEs provide to a much larger computer," Shaffer noted.

"More important to us, however, is the improved communication between remote plant and corporate headquarters, and the invaluable information flow that is now established," he added.

"As it processes data sent in via the plant terminals, the central computer pulls off fresh, pertinent information and feeds it to data base files where it is readily available for operational control and planning, and management decision purposes," he noted.

"In short, the new approach allows us to put in raw data and get back meaningful information – information for decisions on what livestock and materials to buy and when, what products to make and where, what inventories to carry, what costs to watch, and what prices to set," Shaffer said.

In the area of cost control the firm is using the computerized Manufactured Product Standard Cost System. The basic element of this system is a computer-maintained record, comparable to a bill-of-material (BOM) record, for every one of the 300-plus products that Oscar Mayer makes and sells.

Included in the BOM-like records are the standard costs for every element involved in producing the product: labor, materials, supplies and overhead. And, because of the unavoidable differences in equipment, facilities and methods between the individual plants, there is a BOM for each product for each plant.

In other words, the corporate system has information on the cost standards by product, plant and element. Working with these data, the system is used to develop a composite least-cost standard which becomes a benchmark for comparing plant cost standards and a weighted company cost standard which becomes the basis for pricing decisions and for billing products to the distribution centers.

"The standard cost and variance analysis systems are invaluable to production management," John R. Paul, general operations manager, stated.

"We can quickly spot the under-and-over variations against plant and company-wide standards, and then just as quickly zero in on the responsible operations and departments."

A major segment of the company's standard cost system deals with labor cost, Paul added. Oscar Mayer utilizes work measurement controls which result in bonus payments to a large proportion of bargaining unit employees. The central computer performs the calculations in measuring actual performance against standards which eventually tie into the labor cost variance portion of the company's product standard cost program.

"The computer's contribution to operations goes well beyond cost control, however," Paul declared. "For example, the computerized hog evaluation program gives us the ability to cut up hog carcasses in such a fashion as to favor one particular cut over another on the basis of current market value of one product compared to another. This helps us to maximize production yield from a profit standpoint. And, the information the computer furnishes helps us to optimize production scheduling in line with individual plant capacity and overall inventory and demand situations."

The information that feeds the production scheduling system derives from another centralized computer processing routine – tonnage forecasting. Based upon sales history and demand forecasts (continually updated), the 370/158 system is used to create a tonnage forecast for each of some 50 major product lines.

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Opening Doors to Information

Bottle Washer Maker Breaks Barriers With Data Base

ST. LOUIS – "We feel that our new system will open the doors to information. Traditionally, there's been a barrier between data in the computer and actually getting it into the hands of the people who can make use of it. We intend to remove that barrier."

The speaker is Robert H. Chapman, president of Barry-Wehmiller Co. here, the largest manufacturer of pasteurizers for the brewing industry in the world.

The firm is using a Univac 90/30 computer system along with Information Management System/90 (IMS/90), an interactive, transaction-oriented file management system.

The IMS/90 system allows files to be inquired into and modified on-line. Displayed data may be limited to the specific information the user needs and is said to eliminate the requirement for many long paper reports.

By using passwords, access to files under IMS/90 can be limited for security purposes.

Barry-Wehmiller (B-W) was founded in 1897 as the Barry-Wehmiller Machinery Co. producing machinery for a variety of industries.

Around the turn of the 20th century the company designed and erected the first continuous basket pasteurizer. As the market in this product grew, the company concentrated on manufacturing equipment for the brewing industry.

Today, in addition to its pasteurizer business, B-W is the largest U.S. manufacturer of bottle washers. An inventory valued at approximately $8 million is carried by the company.

B-W's principal products – pasteurizers and bottle washers – are sizeable pieces of equipment. They take about nine months to make and cost approximately $500,000 per unit. A typical pasteurizer weighs 150 tons, is 60 to 115 feet in length, 19 feet wide and eight feet high. A bottle washer weighs 135 tons, is 50 to 70 feet in length, 16 feet wide and 15 feet high.

IBM to Univac Switch

Tracing the company's history of data processing, Chapman said that prior to installation of the 90/30 system, the company had used an IBM 360/20 computer, acquired in 1968.

"However, we realized we were only getting accounting information from that machine. What we really need is better management information and greater control of our manufacturing operations.

"We're confident that IMS/90 will provide the information we're looking for. This will enable any of our managers to have immediate access to the information stored in the data base, whenever they need it. It will also eliminate a considerable amount of paperwork," Chapman said.

The company particularly needs to get more instant information on production costs, he added, noting it will use the Unis/90 Industrial Control System from Univac for this purpose.

The 90/30 system now installed at B-W has a main memory of 164K bytes and extended mass storage provided by integral disk drives totalling 57.9M bytes. The peripherals include an integrated card reader, card punch and printer. A CRT display unit is part of the 90/30 console. The system also includes three Univac keypunch units. Seven Uniscope 200 visual display terminals sited in various departments are linked to the 90/30.

Aubrey Roehrs, director of management information systems for Barry-Wehmiller, said the conversion from IBM to Univac was a relatively painless operation taking about four weeks.

"We made preparations for the conversion well before the computer was delivered and performed the entire job in-house," he said.

"We set a target date to implement the 90/30 and to close out operations on the IBM 360/20 and were able to accomplish the task on time. All of our files were converted by punching cards during off-hours in our computer center," he added.

The batch applications converted to the 90/30 include accounts payable, general ledger, stock status, payroll, and various reports including labor summaries.

Since it became operational, Roehrs said, the 90/30 system has boosted overall data processing efficiency and provided the capacity to expand the system.

"Our operators have found the OS/3 Operating System easy-to-use and also relatively simple to train others to use," he added.

Planning Group

To chart a plan for implementing Barry-Wehmiller's long-range management information system, a planning staff was formed composed of representatives from manufacturing, marketing, engineering, accounting, finance and data processing.

This team is responsible for detailed planning as well as implementation planning of all data processing systems. The group meets monthly to review programs and make additional plans. A formal report on progress is made quarterly to the company's executive staff.

Following IMS/90, the next phase will involve placing the Unis/90 industrial system in operation.

Unis/90 is a system for manufacturing planning with aids for plan implementation and monitoring, he said. It spans the development and projection of a master schedule based on customer orders and forecasts through material and capacity requirements, planning procurement, production and shipment of products.

"We realize," Roehrs said, "that Unis/90 will take considerable time for us to install in its full dimensions. Under our planning schedule taking us up to early 1979, we will be implementing the various modules of the program in stages.

"The basic part of the Unis/90 data base will be the Bill of Materials (BOM) files. We have already begun work on organizing the BOM data base structure for manufacturing. In this system the bill of material is computer accessible," he said.

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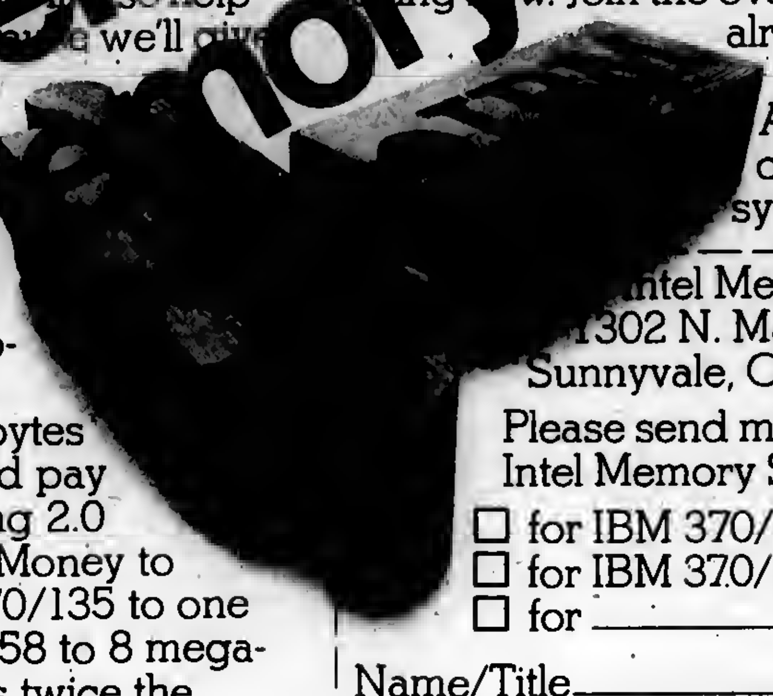

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In 'Westworld' Sequel

Computers Join Act in Tinsel Town Special Effects

LOS ANGELES – From the company that brought you Yul Brynner's "eyes," now comes Peter Fonda's head – all because of computer-based image processing techniques.

A couple of years ago Information International, Inc., here created special effects for the film "Westworld" that simulated the way in which robot-gunslinger Brynner perceived people and objects as a screen comprised of 3,600 tiny squares, each with a uniform color.

Now, for the film's sequel, American International Pictures' "Futureworld," currently going into general release, the company has taken such computer graphics special effects a leap forward.

In "Futureworld," visitors to a futuristic resort are replaced by clones, precise duplicates of themselves. Information International, employing techniques used for illustrating complex scientific phenomena in 3-D color movies, created the special effects for a 40-second sequence in which Fonda's clone is constructed.

Fonda was photographed by three cameras set at precise 45-degree angles as he rotated on an index table. Large blowups of the film strips were made, and placed three at a time on a data tablet with two cursors.

An operator then "sculpted" Fonda's features into a computer memory to create the basic topological data. This encoded data consisted of the coordinates of some 4,000 planar polygons of the actor's hair and face.

This data then was inserted into a Grafix I manufactured by Information International. The system is designed to electronically read printed information and convert it to digital form for computer processing; it can then rearrange and update the stored information for republication.

In this instance, it was employed to convert the 3-D data on Fonda's features into the "look" of his head from a particular viewpoint, on film.

In the sequence, details of a formless head gradually are filled in until the head clearly is Fonda's. This illusion was achieved by devising short segments of film, each with more data added.

"We are implementing recent computer techniques to create natural-appearing pictures of 3-D objects in environments," according to John Whitney, Jr., of the firm's motion picture projects, who worked on the earlier robot's-eye effects and the new illusions.

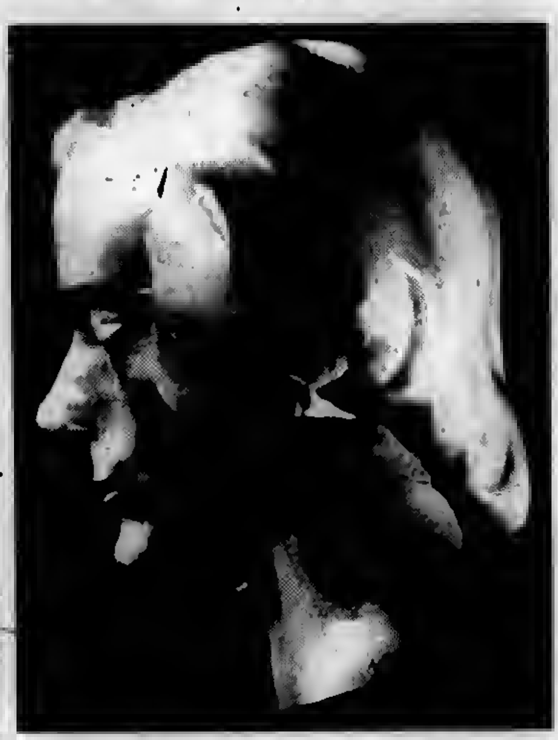
"In many ways, these digital computer processes look to simulate the laws of nature in the real world of physics," he said.

"For every frame of film we expose, we calculate values for perspective; object color and surface characteristics; position, angle and center of view; lighting position, color and strength; depth cuing, and many other variables."

By using viewpoint program parameters, they were able to simulate camera movement, for instance. In part of the sequence, the camera "pans" past the partially completed cranial cavity and across the face as it is being formed.

For another sequence, Information International employed a variation of image processing techniques used in the Mercury and Mars spacecraft missions and in simulating Brynner's perspective in "Westworld." In this 20-second sequence, three samurai materialize in a chamber as part of a character's fantasy.

The set was photographed devoid of actors, and a separate film sequence was shot of the actors on the same set. Data from the latter film was used to form small triangular patches of color. These patches vary in size and location, and are regenerated from frame to frame against the unchanging chamber background, steadily becoming smaller and increasing in number until they coalesce as three men.



Although not on a silver platter, this computer-recreated head of actor Peter Fonda embodies one of the special effects in "Futureworld."

The techniques have potential applications beyond movies, such as simulating structures for medical films, research, architecture, educational films and advertising, Whitney said.

Tri-Star Printers Reduce Paper Costs

MOORESTOWN, N.J. – Tri-Star Computer Systems, Inc. has announced a series of line printer subsystems featuring interchangeable print bands that are said to reduce paper costs and simplify forms requirements.

The subsystems, built around the Control Data Corp. (CDC) 300, 600 and 900 line/min printer family, are available with CDC and Data Products interfaces.

The subsystems utilize lightweight stainless steel print bands. Variable width forms printing ability offers 132 column printing on standard 8-1/2 in. by 11 in. paper.

The 300 line/min model is $6,700 from the firm at 304 Harper Drive, Moorestown, N.J. 08057.

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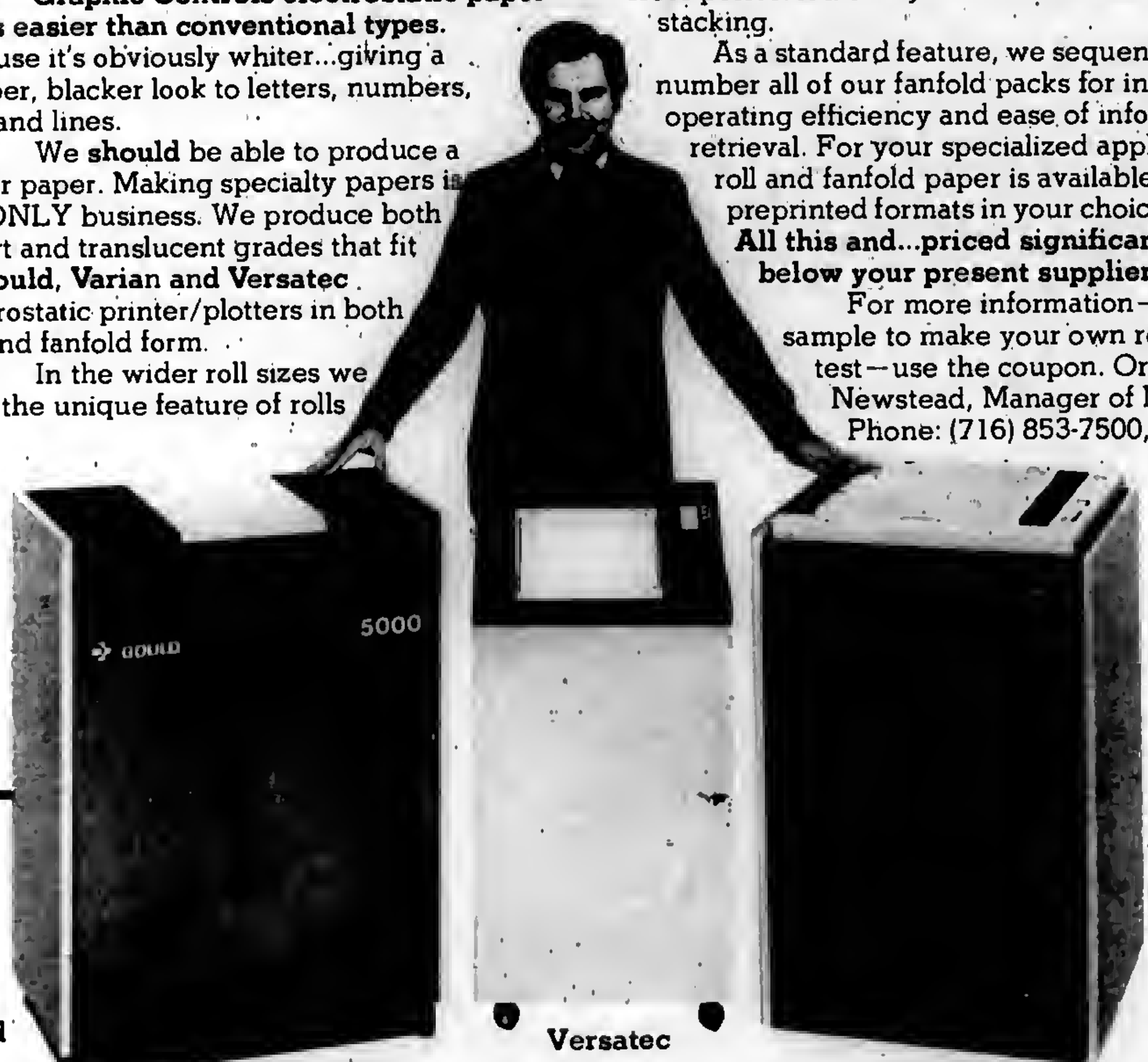

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Seafood Importer Combines Service Bureau, Small System To Cope With Peak Operations

By Esther Surden
Of the CW Staff

SAN DIEGO – A judicious combination of a small business computer and an IBM 360 for peak loads at a service bureau is saving a frozen seafood importer here from having to invest in a large mainframe, according to a user.

"When the product is purchased from suppliers, principally in Mexico, we have to. maintain for inventory each shipment received from that supplier," Frank Barrancotto, controller for Ocean Garden Products, Inc., explained.

"As we sell off his inventory and complete the transaction, he receives an advance. As the product is actually sold, we have to pay the remaining value. This gets rather complicated because it involves not only inventory accounting, but also some financial accounting.

"Banking is involved in it to a degree. On the average, we might handle or process 2,000 or 3,000 shipments each year, each one of which may have ten to 30 line items in detail," he said.

"This is way outside the realm of the small business system," so the company uses the service bureau for this, Barrancotto said.

General ledger is also taken care of by the service bureau, he noted, because it uses much of the same data.

The small business system is currently a Basic Four Corp. 600. The company is in the process of combining the applications run on its own Basic Four 400 with those of its subsidiary, Crest Importing Co. Inc., which also had a Basic Four 400, and converting to the 600.

It probably would have cost "close to twice what we are paying now for hardware alone," to use in-house systems alone, Barrancotto said.

"We looked around and saw Burroughs Corp. systems and IBM for a full in-house system," but discounted them, Barrancotto said.

Principally, the company is running a "traffic system" on its small computer. This is an order entry, invoicing, inventory control on-line system. Inventory is contained on an on-line mode, so as soon as a product is shipped the inventory is updated, he noted.

Business Scattered Over Country

"The business is scattered all over the country. The product is stored in public warehouses, so that we have inventory all over the place." It is not unusual for inventory to be stored in twenty or thirty places at one time," he said.

Accounts receivable, accounting functions, cash receipts, vouchers and special subsidiary financing are maintained on the Basic Four system. "We maintain a subsidiary ledger on all of our banking activity so we know when to pay off notes, etc." Barrancotto said.

"We have a very normal month-end

(Continued on Page 58)

Rest in Peace

ENTERPRISE, Ala. – *Progress Can Be Painful* was the notation on an IBM card shaped cake at the wake following the internment of Enterprise State Junior College's (ESJC) IBM cards in a mock funeral July 26.

ESJC has recently installed a cardless IBM 3 "to enable us to teach the system now used by most businesses," Bill Brown, director of computer services, said.

The mock-funeral idea originated with a computer science class in which the instructor told the students that in the not too distant future the IBM card will be a thing of the past.

"You will have to go to a museum to see one," he told the class, "and even there they will be buried under more modern data entry systems."

Mourners gathered for the sad occasion heard a eulogy delivered by a self-ordained minister and listened to "Precious Memories" sung by one of the students.

Linked to Host CPU

First Phase up in Standard Oil Distributed Net

SAN FRANCISCO – The first phase of a distributed network, encompassing 18 systems linked to a central minicomputer which, in turn, is linked to a mainframe, has been completed at Standard Oil Company of California.

The distributed net is designed to make the order processing easier for Standard's service stations and direct buying customers, allowing next-day shipment from the company's inventory, the user said.

"We are adopting the network to provide better service to our customers and our own operating personnel," according to R.K. Crossan, the firm's assistant director of computer service.

Hewlett-Packard systems have been installed to serve two of the company's Southern Calif. distribution points: the Los Angeles tire battery and accessory (TBA) warehouse and the El Segundo package petroleum warehouse.

The planned 18 systems will be controlled by an HP21MX network central minicomputer, which in turn will transmit confirmed orders and inventory data to an IBM 370/168. Both the 21MX and the 370 central computers will be located at the firm's customer service center in Concord, Calif., Crossan said.

The network is replacing a combination of stand-alone computers, intelligent terminals and manually-operated systems, he noted.

Systems development, proprietary programming and implementation are a joint effort of the company and its systems contractor, Management Systems Technology (MST) of Chicago.

"Many station operators have commented favorably on the service," R.J. Macaluso, project task leader responsible for the system design and implementation, said.

"In addition, if an item is back-ordered, they appreciate being informed during their original phone order exactly when they can expect the back-ordered item," he noted.

A Chevron dealer, for example, can place one phone order through the Los Angeles TBA warehouse for any one of 1,200 TBA items stocked there (and also for packaged petroleum products sold at service stations).

The order, filled from inventory, can be delivered within 24 hours, according to W.G. Larson, the company's marketing division manager who was responsible for the warehouse during the implementation process.

Order entry personnel, through HP video terminals, make available to phone

(Continued on Page 53)

Shugart Adds Minifloppy Drive

SUNNYVALE, Calif. – The Shugart Associates SA 400 minifloppy is a floppy disk drive in a package the size of a cassette tape unit, the firm said.

Designed for use with minicomputers and microprocessors, the unit has a 125K bit/sec transfer rate and can store 109.4K bytes of data unformatted and 89.6 K bytes formatted, the company noted.

The drive employs a proprietary glass bonded ferrite/ceramic read/write recording head technology, the same as is available on the firm's SA 800 drive. Write protect circuitry is a standard feature, according to the firm.

The controller for the unit can handle up to three of the minifloppies. Using the IBM 3740 format with modified gap structure and a 128-byte buffer, the controller operates with an 8-bit byte bi-directional parallel I/O channel. It also features direct track/sector addressing, Shugart noted.

The media for the minifloppy will be available from Shugart and other media manufacturers, a spokesman noted.

The minifloppy costs $390; ten diskettes cost $45. The controller costs $490 with delivery in 90 days from Shugart Associates, 435 Indio Way, Sunnyvale, Calif. 94086.

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For Loan Commitment Work

Mini Speeds Up Forms Process

CLEARWATER, Fla. – A minicomputer dedicated to on-line loan commitment work has automated the complicated forms process at First Federal Savings and Loan of Clearwater here.

The system "does everything from typing a commitment letter to preparing 38 different loan documents," Jack P. Davis, systems specialist said. Daily, weekly and monthly reports are also generated providing management with cash flow projections, statistical data and loan closing schedules, he noted.

The configuration at First Federal includes a Burroughs B-721 and 64K of memory, a dual-drive disk cartridge subsystem, an 85 line/min printer, a CRT and cassette station. It cost about $70,000, he noted.

Prior to implementing the dedicated mini the firm had been preparing the forms manually. When it realized the need to automate its operation, the association looked at Wang Laboratories, Inc. and Nixdorf forms preparation machines as well as a Burroughs Corp. minicomputer.

Burroughs Chosen

The minicomputer was chosen because Burroughs agreed to work with the association to develop a program to fit their loan preparation needs and because many more loans could be processed on the mini than on alternative systems, Davis said.

"The other forms preparations systems use cassette tapes which are quite bulky and very slow. With this system we are able to have the loans all random access, whereas with a cassette system it could take five or 10 minutes to get to any one loan depending on where it was located on the cassette or what cassette it was located on," Davis said.

Currently the system can handle 800 individual loan files at one time in various stages of completion.

Once the minicomputer completes all the forms, the information needed by the association's data center, Sunshine State Systems, Inc., is transmitted via telephone data line to the CPU, he noted.

The data included in the transmission includes all journal entries, general ledger transactions and all file maintenance necessary to establish a new mortgage loan.

The loan program, written by Burroughs and defined by the association, is about "95% operational," he added.

The association has about 70,000 account holders, 190 employees and nine branches as well as a main office. "We have visions of within the next year tying all our branches into the minicomputer and letting them have access to the loan system," Davis said.

The project was spearheaded by Thomas A. Meyer, vice-president of Administrative Systems.

"Our association needed to automate the processing of mortgage forms. A loan that takes a typist 3 to 4 hours to type now takes the computer only 10 to 15 minutes," he said.

"Unlike other forms preparation systems which utilize cassette tapes, our system can be updated and changed at will and the data, once entered, is used for all phases of processing.

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First Time User Needs Selection Specialist

By Kevin Stumpf
Special to Computerworld

In Canada a breed of computer consultant exists called the "First Time User Specialist." Here a Canadian reader explains this strange breed.

The "First Time User Specialist" is a specialist who will provide assistance in the selection and installation of a computer system in a company that has no experience with computers.

You might say, why should I spend more money, especially at professional rates? The already large amount of time, money and effort invested into the computer project justifies this.

You can now say that all computer endeavors have the same requirements, whether it's your first or fifth computer.

That's true, but after your first successful computer installation you know what to expect and how to handle the project while the first time user does not have that experience and must rely on someone for assistance.

Usually they rely on their vendors, but salesmen are salesmen and programmers are programmers.

The specialist will make inquiries regarding the user's application, perform feasibility studies, inform the user what to look for in a computer company for selection purposes and basically create a bidding document for the selection of a computer.

Based on qualitative and comparative analyses, the specialist will also do a preliminary selection of all companies that can handle the application, a sort of first-round-cut, and prepare these for presentation to the user.

The user simply attends scheduled demonstrations and makes a final selection. As a consultant, the specialist will make suggestions but no decisions. This service allows the user to operate his company without interruption.

During the next phase of the project, programming is very critical and its success depends upon knowledge of both the computer system selected and the user's requirements.

In some cases it is advantageous to have the specialist's firm perform the actual programming because of their attained knowledge of a user's requirements.

In other cases, where the system is small and simple, a user could have a software firm supply the programs.

It is not only beneficial to obtain the services of the specialists because of their knowledge of systems but also because of a situation which is occurring in the computer market.

There is an increase in the number of computer companies on the market and with the advent of franchised computer sales, the quality of computer sales forces and maintenance services has decreased.

The first time user specialist is aware of all new equipment and companies on the market and it is his job to suggest only the best computers for the user to review.

Stumpf is proprietor of Computing Elements Development in Waterloo, Ontario.

Mini Bits

Datum Tape Controller Fits Harris Systems

ANAHEIM, Calif. – A tape controller/formatter from Datum Inc. interfaces seven- or 9-track, IBM compatible tape transports to Harris Corp. Slash 4, Slash 5 and Slash 7 minicomputers, the firm said.

The Model 519H provides multi-transport operation for up to four parallel drives with speeds from 12.5 in./sec to 200 in./sec. It is directly compatible with the Harris system's timing functions and generates proper formats and control signals for NRZ encoded tapes at 800 bit/in., 556 bit/in. and 200 bit/in. or phase-encoded tapes at 1,600 bit/in., the firm claimed.

Prices for the controller/formatter range from $4,100 to $9,710 depending upon tape format and cabling required from Datum Inc., Peripheral Products Division, 1363 South State College Blvd., Anaheim, Calif. 92806.

Wordplex Systems Added

WESTLAKE VILLAGE, Calif. – Ventek Computer Systems has announced the Wordplex/1 and Wordplex/7 word-processing systems based on the firm's own 64K processor, according to a spokesman.

The Wordplex/1 is a stand-alone system while the Wordplex/7 features multiple workstations. The Wordplex/1 can communicate to other systems in the field or to a mainframe computer, the firm noted.

A 12-station Wordplex/7 costs about $150,000 while a stand-alone Wordplex/1 costs $16,000, the company said from 31829 W. La Tienda Drive, Westlake Village, Calif. 91361.

Data Recorder Enhanced

BALTIMORE – Columbia Data Products, Inc. has enhanced its intelligent 3M-type data cartridge recorder with an improved search mode feature, according to the firm.

The enhancement allows searching for records or files using any sequence up to 32 alphanumeric characters of actual data as an identifier, the firm said.

The Model 300B costs $1,795 for a single-track unit and $1,995 for a four-track unit. Columbia is at 6655 Amberton Drive, Baltimore, Md. 21227.

Portable MSS Improved

LANHAM, Md. – Computer Operations Inc.'s portable Linc Tape mass storage system (MSS) can now be used with Digital Equipment Corp. PDP-11 and Data General Corp. Nova minicomputers, the firm said.

The unit allows users to edit, compile, assemble and load programs in the field.

The Linc Tape can accommodate 672K byte/reel and has a transfer rate of 8,400 byte/sec, Computer Operations noted. It costs $2,295 from the company at 9700-B George Palmer Highway, Lanham, Md. 20801.

IBM Time Down 'Tremendous'

Lighting Firm Braves Independent Peripheral Jungle

GRIFFITH, Ind. – An IBM printer gone awry, combined with rising IBM 3 peripheral costs, prompted Smith-Victor Corp. here to brave the independent peripheral jungle and configure a system that it estimated will save $60,000 over the next five years.

"We had a repair man in every day for the first eleven days we used the IBM printer. Our downtime was tremendous. The printer kept pulling off the top copy of our seven-part shipping form. The only way it could handle the form was to remove the two bottom copies and even then there were still problems," Ken Janusz, controller for the company, said.

Smith-Victor sells lighting equipment for professional photographers and television stations. The initial minicomputer configuration at the firm was a leased IBM 3/10 with two 5444 disk drives and the 5203 300 line/min printer.

The firm purchased the IBM 3 after leasing it for two and a half years and building up rental credit on the system. The firm's first contact with independent peripherals came when it decided to get some add-on memory from Business Systems Technology, Inc. (BST) about two years ago. It upgraded to 8K of IBM and 16K of BST memory then.

Because of the firm's dissatisfaction with the printer's performance as well as its slower speed, the company looked around for a way to upgrade last November, Janusz said.

The firm could have chosen an IBM 1403 printer, Janusz said, but the BST 750 line/min printer it did choose was less expensive and could handle the thick shipping form, he noted.

At the same time the company changed printers it also changed from IBM disk drives that had nearly reached full capacity to BST drives.

"For about a hundred and a half more a month we went up from small drives to two big ones and doubled our print speed," he said.

"The real reason we went to BST is that they offered it all in one package: the printer, the disk drives and the core, with help in obtaining a third party lease on it," he noted.

Other independent manufacturers were considered before the firm chose BST, but "they didn't have too large an installed base," he said.

The system handles the firm's financial and inventory applications including order processing, invoicing, accounts receivable, monthly customer statements, sales analysis reports, payroll general ledger, production control, costing and finishing goods inventory.

The $60,000 savings over the next five years was estimated because "a similar IBM upgrade would have cost the company double what it is paying for the BST equipment," he noted.

Sorbus does the maintenance on the core memory and printer and Memorex does the maintenance on the drive, he added. So far there have been no finger-pointing incidents, he said.

Standard Oil Plans Net Using 18 Minis

(Continued from Page 51)

customers virtually all pertinent computerized information, according to a spokesman. An account file may be accessed by customer name, service station number or account number.

Special promotions or quantity price breaks are displayed for any group of items being ordered. Credit information and delivery instructions may also be verified during phone orders, he said.

If a packaged petroleum product is out of warehouse stock, the HP minicomputer checks to determine if the requested item is in current production. If so, it is packaged and routed directly to a shipment assembly area, circumventing the warehousing function. As items are ordered, inventory quantities are automatically adjusted, he noted.

Nightly stock replenishment analyses, empty container availability reports and petroleum replenishment schedules are also produced by the minicomputer. The petroleum replenishment schedule determines which product grades are required to be filled in various size containers for the following day.

As a byproduct of order entry and inventory data, the minicomputer produces picking lists, shipping labels, packing slips and truck loading schedules, he said.

Bin location assignments are also computer-controlled. Several bins throughout the warehouse may be allocated to a common item, such as oil filters. The system will then route the picker, selecting bins in the order of optimum picking efficiency.

Nightly manpower reports for warehouse managers forecast estimates of picking and loading manpower required for various warehouse sections on the following day. Each day several hundred orders, involving thousands of line items, are shipped from each location.

DP Workload Reduction

"Our online system will substantially reduce our DP workload," Crossan said.

Previously orders were received manually, forwarded to order-entry personnel for keypunching, then processed for shipping. Later, in a separate operation they were invoiced centrally from Concord. Now one video entry at a processing point produces all locally required shipping, warehousing, inventory, billing records and adjusts numerous management operating records, he said.

In addition, data from the same entry is transmitted to Concord for central invoicing, he noted.

Files and programs will be downloaded to the distributed sites. Thus, the company's data base will be controlled centrally, programs will be maintained uniformly without the expense of local programming staffs and processing time of the distributed minicomputers will be maximized.

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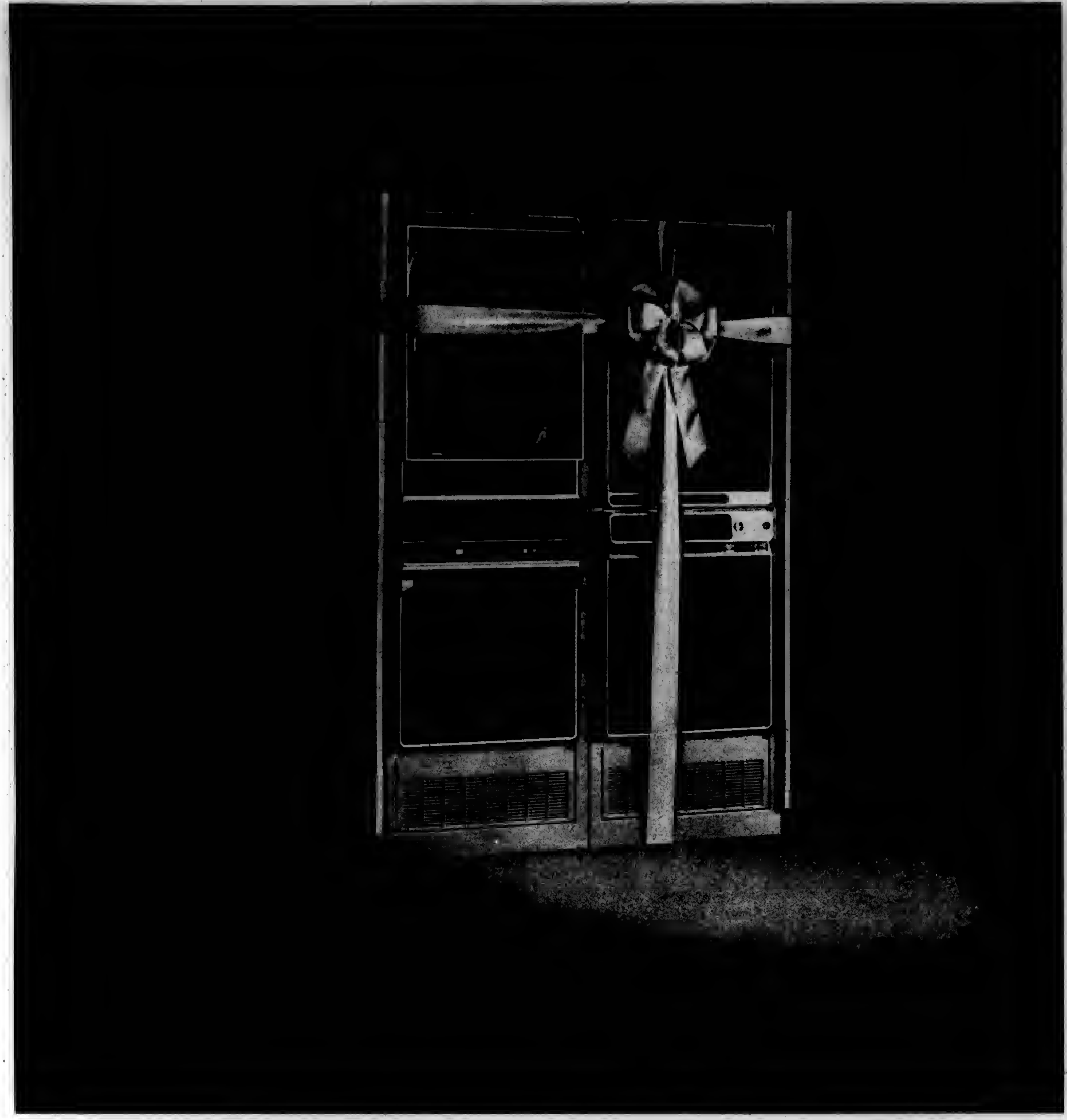

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Firms' Equipment Choices Eased With Modeling on Desktop Unit

By a CW Staff Writer

GREENSBORO, N.C. – With an IBM 3 in the computer room, a user here has purchased a portable computer for a specialized application.

The IBM 5100 at ARCT, Inc. was "purchased exclusively for special modeling" according to Gary Brown, an independent in-house consultant to the firm.

The company is a distributor of textile machinery, a subsidiary of a textile manufacturing firm located in France. It has a 16K IBM 3/10 with 9.8M bytes of disk, a 200 line/min printer and a card unit which it uses for inventory control and accounting type applications, Brown said.

The 3 could not handle the modeling application, he noted, because "first of all, we had a requirement for a portable machine that we could take into various customer locations and enter data and run there. Also, the type of modeling was best approached in Basic or some other problem oriented language, not RPG."

The 5100 was chosen for the job because it was a "very special project with a time deadline and the time deadline didn't provide much opportunity for shopping around." Another consideration, Brown noted, was service, for which the company was certain IBM would be a good choice.

The 5100 was installed in December. It is a 32K Basic machine.

The application developed for ARCT by Brown's firm, Datapor Inc. of North Carolina, a management consultant company, was undertaken to "help mills determine the most efficient equipment to buy and as a byproduct help design future equipment," Brown noted.

The company sells to "texturing mills," he explained, which fluff the fiber to get it ready for knitting.

Machinery makers have been manufacturing faster and faster systems, he noted, but the profit per pound of fiber has been going down, to the point at which it may have reached diminishing returns.

The 5100 takes actual data and hypothetical data, looks at it on an existing or theoretical basis and the user can change values such as labor costs and predict profitability, he added.

"Each of us has to know the specific return on investment, capital investment per pound of yarn and conversion cost per pound of yarn," Robert F. Waters, executive vice president of ARCT, Inc., said.

"We can now take customer conditions, plug them into the computer model and get the cost relationships for them. Using both hypothetical and real machinery and plant conditions, we've been able to determine in minutes on the small computer what it would take weeks to determine by hand," he said.

"The value of the variable-base model is the ability it gives us to put 'what if' factors into the conversion costs. In addition to machine prices and yarn processing rates, we've also been able to look into the performance of fibers at the higher machine speeds."

The computer model, Waters said, takes into account productive capacity, capital investment, plant labor, utilities, manufacturing supplies, depreciation, interest and plant general and administrative expenses. From this, the results show the total capital investment per pound of yarn for various machine speeds, and the total conversion cost per pound.

Waters explained his computer simulation model using a 30 million pound texturing plant with a "standard" 400 meter per minute friction twist machine processing 150 denier yarn. From that, he used the computer model to look at the higher through-put speeds of 600 and 800 meters per minute.

With the IBM 5100 portable computer, Waters said, he considers approximately 200 variables related to yarn production.

In the first of three computer models, the three machines (400, 600 and 800 meters per minute) for comparison are assumed to have the same space, perimeter area, labor and prices. After considering all 200 variable elements, the computer provides the base capital investment summary per pound per year and the total conversion cost summary.

A second model maintains the summary elements of the first model, but corrections are made to establish 600 and 800 meter per minute machine prices. Both machine and perimeter areas are increased, while machine and operator efficiencies, break factors and maintenance factors are retained.

(Continued on Page 56)

The portable IBM 5100 system at ARCT, Inc. is used to calculate capital investments and the costs of converting yarn for textile manufacturers.

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For PDP-11/70 Minis

Ampex Has DEC-Compatible Core Memory

EL SEGUNDO, Calif. – A plug-compatible core memory for a Digital Equipment Corp. PDP-11/70 computer is available from Ampex Corp.

Billed as a "transparent alternative to or replacement for the MJ11 memories used in the PDP-11/70 computers," the ARM-1170 memory is available in 128K byte (32K words of 36 bits each) increments and is capable of expanding PDP-11/70 computers to their maximum 4 megabyte capacity, the firm said.

Components required to achieve expansion to the 4 megabyte maximum can be accomplished within the two PDP-11 cabinets, a spokesman noted.

Throughput enhancement is provided by the two- or four-way internal interleaving features in the ARM-1170, he said. Using four way interleaving the effective cycle time is 350 nsec as compared with 800 nsec for the basic ARM-1170. External interleaving between memory chassis is also available, he noted.

One Mbyte (256K memory words of 36 bits each) of ARM-1170 memory sells for $48,500 and takes up 22.75 in. of rack space within the PDP-11/70 cabinet, Ampex added from 200 N. Nash St., El Segundo, Calif. 90245.

Nashua Unit Replaces IBM 3 Disk

NASHUA, N.H. – Nashua Corp. has announced what it said is an improved handle design for the IBM 3 disk cartridge.

The handle "replaces the double-function handle" formerly used on the cartridge and replaces about 17 parts with three parts, a spokesman said.

Pulls Straight Up

"All that is necessary to open disk cartridges with the single function handle is to pull the handle straight up," he noted. It also protects against dust penetration by eliminating cover openings of the older handle design, the firm claimed.

Holding Device

A holding device to permit uniform pull across the entire cartridge when it is opened has also been added, Nashua said.

The cartridge costs about $85, a spokesman said from the Computer Products Division, Nashua, N.H. 03060.

Lab System Peaks

MARLBORO, Mass. – Digital Equipment Corp. (DEC) has a laboratory automation system based on its PDP-11 minicomputer that is said to acquire and analyze data simultaneously from as many as 16 different analytical instruments that produce data outputs with peaks.

The system is designed for use with gas and liquid chromatographs and with atomic absorption, ultraviolet-visible and infrared instruments.

Based on either the PDP-11T34 or its floppy disk version, the PDP-11F34, the system has 32K words of either core or semiconductor memory.

The Peak-11 software runs under the firm's RT-11 foreground/background operating system and uses multi-user Basic, DEC said. In the foreground the Peak-11 software collects the data and performs peak processing while in the background it analyzes the stored information, the company noted.

The system prices begin at $33,905, DEC said, depending on configuration. It will be available in October from the company in Marlboro, Mass. 01754.

Datum Introduces Input Subsystem

ANAHEIM, Calif. – An analog instrumentation input subsystem from Datum, Inc. allows development of custom data acquisition, control, monitoring and data logging systems, the firm said.

Designated the Series 7200, the system allows users to choose any number or type of analog inputs as well as the type of minicomputer used, Datum said.

The firm integrates the input subsystem from modular components, with a pretested assembly ready for installation in Data General Corp. Nova and Eclipse, Digital Equipment Corp. PDP-8 and PDP-11 or other minicomputers, the company noted.

Analog input is accommodated by eight-channel multiplexer cards inserted into a 16-position chassis. Sixteen chassis give a total of 2,106 channels; two channels in each chassis are used for calibration, Datum said.

The Series 7200 analog input subsystem costs $10,000 to $20,000 depending on the number of channels and options, the firm said from 1363 S. State College Blvd., Anaheim, Calif. 92806.

Mini For Modeling Helps Predict Costs

(Continued from Page 55)

In the third model, which completes the transition from the "standard" 400 meter machine to the 600 and 800 meter machines, operator and machine efficiencies are reduced, break factors are increased, and maintenance factors are also increased. All else remains the same as in the first two models.

Summary results show the conversion analysis with almost identical costs on the 400, 600 and 800 meter assumptions.

"When all three models are re-run using a heavier weight yarn supply package, the computer model shows an advantage in the heavier supply of about .9 cents per pound," Waters said. "In our hypothetical 30 million pound plant, that's an advantage of about $275,000 a year."

The costs presented by the computer models ARCT developed are based on their assumptions and not those of a user, Waters emphasized.

"But that's specifically why we developed the models," Waters said. "We wanted to be able to put customer conditions and assumptions into the model and give the customer his bottom line figures in a very short time.

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Cost for the seminar, including continental breakfasts and luncheons and all course materials is $300 for the first registrant, and *$260* for additional registrants from the same company.

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Led by Roy N. Freed, the internationally known lawyer, author and educator in the field of computer-law, this 2½-day seminar will show you how to protect your interests when dealing with vendors that supply your installation. The seminar covers all types of contracts impacting computer use — including your own contracts. Other subject areas include negotiations, warranties, avoidance and resolution of disputes, security, fraud, taxation, and techniques for handling any transaction.

Cost for the seminar, including continental breakfasts, luncheons, and all course materials is $325 for the first registrant, and $275 for additional registrants from the same company.

NEW YORK ... **Plaza Hotel** .... *Oct. 27-29*
CHICAGO .... **Hyatt Regency O'Hare** ... *Nov. 3-5*

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Led by Saul Stimler, author of *Data Processing Systems: Their performance, evaluation, measurement and improvement*, this two-day seminar will give you performance measurement techniques that are *designed* to save your installation money. As well as system performance at your own installation, topics covered include: criteria for quantifying performance, pencil and paper analysis of a system, benchmarking techniques, realtime, batch, and interactive time sharing systems.

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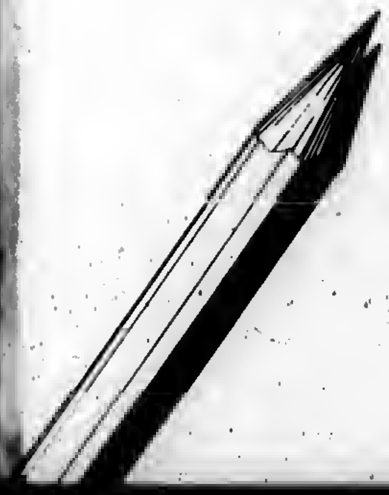

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CIRCULATION DEPARTMENT

While Classwork Continues

Systems Replace Time-Sharing and Cut School's Costs

BROOKFIELD, Conn. – Faced with rising costs and unsatisfactory service, Brookfield High School unplugged the computer time-sharing service it had been using and bought its own minicomputer system.

"We decided to buy our own computers when we realized we could do so for the same amount we would have spent on time sharing," Frank Short, the mathematics teacher in charge of the two small systems, said.

The time-sharing service, offered by a local college, had supplied the school with one Teletype terminal on-line to a Digital Equipment Corp. PDP-8 computer and another, off-line, terminal used to punch paper tape to speed up the use of the on-line terminal.

Short described that as essentially a one-user system, for which Brookfield paid approximately $3,400 per year. "We needed an additional on-line terminal, which would have brought our annual rent to nearly $6,000 per year," he said.

"Our two Wang [Laboratories, Inc.] computers together cost about $30,000 and we'll pay for them over five years. At the end of that time we'll have two computers rather than a handful of lease payment receipts," he added.

Brookfield's equipment now includes a Wang WCS 20 processor with CRT display, dual diskette drive, cassette tape drive, card reader and 100 char./sec printer. A Wang 2200S processor with a modified IBM Selectric typewriter is used for hard copy output.

Four major advantages to the Wang equipment, according to Short, are that the systems are quieter than the Teletype machines they replaced, have been more reliable and they give Brookfield High control of its own computer resources for the first time.

Finally, they allow batch processing using marked cards, taking program throughput from one per 15 to 20 minutes to a program in 30 to 90 seconds.

No Disruption

"We can use the Wang computers in the classroom without disturbing the class," Short explained. "That wasn't true of the Teletypes. Also, we can link the computer to large television monitors which enable the entire class to see a display at one time.

"We installed the Wang computers last October, and since then, we've been down a total of two hours. Even that was not the fault of the computer. Someone dropped the machine and broke the on/off switch," he said, adding "I soldered it back on, myself.

"We had a mechanical problem with one diskette unit at one point, but the Wang service man was here first thing the next morning."

Short said a major problem with the service bureau was that the bureau controlled the computer and, therefore, the data stored in the computer by Brookfield students.

"They could dump stored programs from their disk whenever they wanted and did so on some occasions without telling us," he complained.

Short described "being locked into Basic as our only software programming language and if we were going to teach Fortran, we'd want Fortran IV. None of the other machines we looked at really had a strong Fortran IV capability."

Primarily Instructional

The Wang computers are used primarily for student instruction, with emphasis on the subject matter of mathematics and social science courses rather than on computer programming techniques, he said.

The WCS 20 is also used, however, to help maintain attendance records, an application Short said had not been practical when the school used the service bureau because the college would dump, rather than maintain data files.

"Rather than keeping attendance sheets, now, we have punch cards for each student. These cards are sent to the office and run on the computer in about ten minutes. It saves us half an hour to an hour over the old method and the advantage is that first period teachers can now verify attendance. They couldn't, before."

Next year, the school plans to use its computer to help maintain each student's record of absences and tardiness both for school and for state reporting purposes, he said.

Short himself uses the computer in Algebra II classes as well as in analytical geometry, trigonometry and general math.

"Take a typical problem – given three points on a coordinate plane, develop a program to determine whether or not the three points are colinear; and, if not, determine the equation, center and radius of the unique circle on which those three points lie.

"The student is forced to develop the equation, arrange it; so that the problem is solved in its proper sequence, then verify the answer, to see that the algebra is correct. The computer forces students to generalize the algebraic solution, because otherwise, each problem would take a month of Sundays to solve."

Other applications for the computer are in statistics and probability.

The system at Brookfield can be used while class is in session. Here, Frank Short instructs two students.

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System Helps Standardize Psychiatric Treatments

DES PLAINES, Ill. – A minicomputer at Forest Hospital here is being used to help standardize psychiatric treatments using a goal-oriented approach in a singularly non-standard field, according to Dr. Monte J. Meldman, director of research for the hospital.

The PDP-11/40 from Digital Equipment Corp. (DEC) computes the test marks of psychiatric patients and consults narrative text files to print out test impressions, probable diagnosis, drugs that could be used in treatments and predictive statements about the patient's recovery," Meldman said.

"We have an automated goal-oriented record form for documenting and evaluating the clinical state and progress made by psychiatric patients," Meldman noted.

Running under software developed at the 150-bed hospital, the system stores a goal list, treatment plan, mental status exam, progress notes and follow-up interviews for each patient.

The Psychiactric Information Processing System (Pips), he explained, is an interactive system in which all patient information is data-based in a relational inquiry storage system. Data is captured from staff, patients and relatives of patients to develop the base.

The system is also being used to perform psychiatric tests for multiple institutions. About 800 hospitals are evaluating their tests on the system, Meldman said. The tests are scanned by an optical scan mark sense reader.

The configuration at Forest includes a PDP-11/40 with 104K words of memory, three DEC RK05 disk drives, tape transport and about ten Applied Digital Data Systems CRTs.

When the Relational Inquiry Storage System (Riss) program was ready to be run, the hospital realized it needed more storage capacity, Meldman said, and examined the options open.. The hospital finally decided to buy the 800 micro controller mass storage device from Advanced Electronics Design (AED).

The installation in June of this year was not without one minor problem, Meldman noted, but he said the problem was normal because "every time you put a new piece of equipment in, it doesn't work for two weeks."

The problem was solved by an AED engineer, he noted.

"The new configuration represents a quantum leap for the hospital system," Meldman continued. "Previously spacebound with only three RK05's, we increased our storage by 20K words or the equivalent of 17 RK05s for a cost of $18,000," he said.

"The new system operates about three times as fast as the old," he noted, and "runs the hospital census system off in seven minutes, as opposed to the old system which took 18. The Minnesota Multiphasic Inventory psychological test reports are now processed in 30 seconds."

Service Problem

Service for the system is a problem, he said, but the hospital is planning to buy a set of replacement boards for the unit to help alleviate it.

DEC has been "very helpful," he noted and the only regret the hospital has is having to put an independent peripheral on the system.

"In fact, we are going to have a DEC PDP-11/34 for bookkeeping" installed, he said.

Independence Is Answer

DES PLAINES, Ill. – Forest Hospital here was faced with the need for increased disk storage, so Dr. Monte J. Meldman looked at his minicomputer vendor's offerings as well as that of an independent manufacturer.

What he saw was that the mini's standard disk was twice as expensive as the independent, too big to fit into the small computer room, and that if he went ahead and purchased the disk, he'd need to bring in three-phase current which would cost an additional $10,000 to install.

His answer? The independent's equipment. See story above.

Mini, Service Bureau Join for Cost Cuts

(Continued from Page 51)

peak. At the end of the month, we merely dump all of the transactions from the Basic Four and all of the associated master files onto the tape drive. We then send the master tape to the 360 and they do all of the heavy work," he said.

All file maintenance activities are taken care of internally, he noted.

The configuration at Ocean Garden includes the CPU; two disk drives, with twice the capacity of the disks on the 400; six terminals; two printers; one magnetic tape drive; and one paper tape punch.

A somewhat unusual use of the computer, according to Bob Murphy of Haskin and Sells, a consulting firm that is doing the systems design work for Ocean Garden, is the paper tape punch being used to drive Western Union TWX machines.

A program translates all the shipment information to the eight-channel tape, he said, saving the company from having to have the TWX machines on-line.

The TWX units are used in the traffic department, and the information is TWXed to the warehouses and the firm's brokers, Murphy noted. Three Telexes are also used; and the firm is considering some programs that would allow it to go to five-channel paper tape to send some reports out on Telex, Murphy said.

The consultant has been involved with the company since 1972, after the firm's experience with a leased 360/30 made them want to get away from cards, he said.

Presently Murphy is involved in the updating of the system and the combining of the two Basic Four systems used by Ocean Garden and its subsidiary.

Most of the applications programming has been done by Interactive Computer Systems, a Newport Beach firm, Barrancotto related. One programmer has been recently hired to work in-house.

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CI Notes

CDC Reworking CMI Pact; Colt 45 Plans in Limbo

MINNEAPOLIS – The Colt 45, Cambridge Memories, Inc.'s (CMI) version of the IBM 370/145, is temporarily in limbo until Control Data Corp. reworks its agreement with CMI to provide for someone to manufacture the system.

According to the original agreement, CDC obtained marketing rights, but not manufacturing rights.

Since that time, however, CMI has retrenched its operations because the First National Bank of Boston called in its $16 million loan to the firm.

A CDC spokesman indicated the mainframer expects to firm up its plans in two or three weeks.

O-I Licenses Plasma Technology

TOLEDO, Ohio – Owens-Illinois, Inc. (O-I), which claims to have developed commercially marketable flat screen plasma display panels, is offering licenses on the process.

IBM is among the licensees, according to O-I, whose pilot plant for Digivue panel production can no longer satisfy demands.

The firm said it "has a strong patent position in the plasma panel field," and intends to continue to develop the technology and strengthen that position.

Supershorts

Data Dimensions, Inc. has extended its agreement with Educom, a consortium of educationally oriented nonprofit institutions.

– – –

Tymshare, Inc. has increased its investment in Cegos-Tymshare to 45% and obtained an 11% interest in Sligos. Both computer services firms are based in Paris.

– – –

Dataproducts Corp. has produced its 10,000th Model 2230, a 300 line/min printer.

– – –

General Datacomm Industries, Inc. has appointed Anixter-Pruzan, Inc. as its nonexclusive distributor in Alaska.

– – –

Monolithic Memories, Inc. has established a wholly owned Japanese subsidiary, MMI Japan KK.

Study Cites Trends in U.S.

Mini Shipments Slowing to 19%/Year

By Toni Wiseman
Of the CW Staff

SAN JOSE, Calif. – "After a decade of spectacular growth, the minicomputer industry is now experiencing a slackening in growth rate which, in the next five years, is expected to be well below the 40% compound annual growth rate of the preceding five years," a recent report by Creative Strategies, Inc. (CSI) forecast.

Even so, the domestic market will grow at a compound annual rate of 19% from 28,500 units shipped in 1975 to 68,000 units in 1980, CSI predicted. Worldwide shipments by U.S. manufacturers should reach a value of $1 billion by 1980.

For the study, CSI chose a price rather than a marketing definition of a minicomputer: "A minicomputer is a processor with operating software and peripherals where the typical configuration sells for less than $25,000."

Faced with peripherals and associated hardware representing an increasing percentage of system cost, mini makers will tend to provide a larger portion of the system, the report observed.

By 1980, the trend for minicomputer suppliers to sell complete systems will culminate in a 50-50 ratio of sales to OEMs and end users. Mini makers currently sell about 65% of their equipment to OEMs.

The study noted several reasons for the decline in mini growth. First, the market traditionally served by minis is slowly being eroded by medium- and large-scale computers, intelligent terminals, programmable calculators and, on the low end, microprocessors and microcomputers.

In addition, many minicomputer applications are becoming saturated, the report said, adding, however, that as minicomputer technology advances in terms of components, memory and architecture, new applications are evolving.

Looking at growing application areas in terms of dollars, CSI said industrial automation in 1980 will continue to lead with $208 million in equipment compared with $93 million in 1975.

Business DP will jump from fifth to second place, consuming an estimated $165 million in minis compared with $38.4 million in 1975.

CSI's category of "other" will grow from sixth to third, totaling $112 million by 1980, while fourth place will be laboratory and computational gear, a drop from second place in 1975.

Fifth place in 1980 will be DP support for $108 million in equipment compared with fourth place or $45.7 million in 1975, according to the study.

(Continued on Page 60)

Lessors Outline Changes Wanted In Federal Procurement Policy

By Molly Upton
Of the CW Staff

Although several lessors conceded the Federal government is making strides in its efforts to encourage competitive bidding, they nonetheless have a list of procedures they would like to see implemented.

Essentially the suggestions made in a *Computerworld* survey focused on actions the lessors think would allow more lessors to compete for requests for proposals (RFP) and more standardization of criteria by which some awards are judged.

Some elements mentioned include:

- Multiyear leasing.
- Wider acceptance of plug-compatible equipment.
- Quick decisions on procurement.
- Separation of maintenance from the equipment bid.
- More rules on forming groupings within bids.
- Standardization of residual value calculations.
- Standardization of what constitutes a balanced vs. unbalanced bid.

Nearly all lessors interviewed mentioned multiyear leasing high on their lists. Currently most government procurements are granted on a year-by-year basis.

However, one lessor spokesman indicated the ability to assess penalties for cancellation before the end of a system's life helps alleviate the disadvantages incurred in writing a one-year lease.

A system's life is the duration the using agency expects to keep the machine.

"The government's done a good job in structuring this. The penalties help get around the problem of the agency being unable to commit for a long-term lease," he said.

(Continued on Page 60)

OMB Orders DP Cost Cutting

WASHINGTON, D.C. – At President Ford's behest, the Office of Management and Budget (OMB) has directed federal agencies to formulate cost-cutting programs for their DP activities.

The General Services Administration (GSA) has submitted a plan, as requested, for increasing the use of "third-party" and "plug-to-plug" compatible DP rental contracts government-wide.

In a memo sent following a Presidential management meeting, OMB Director James T. Lynn focused on DP cost-cutting along with contracting out and holding down overhead costs as well as other items, such as reducing federal paperwork.

The memo asked agencies to submit plans by Aug. 23 on their intended actions in the following areas:

- Reducing the unit cost of DP.
- Elimmating nonessential or marginal computer workload.
- Reducing equipment rental through increased competition.
- Analyzing the need and methods used for expanding government computer capacity.
- Minimizing the automatic computer issuance of inaccurate or unnecessary checks and purchase orders.
- Strengthening agency DP management to overcome problems of computer fraud and security.

By Oct. 21, agencies that are large DP users must submit results of an equipment rental review to GSA, according to the memo.

"This review will identify the extent to which the agency is using 'third-party' and 'plug-to-plug' contracting techniques, the savings that have resulted and plans for extending the use of these techniques

(Continued on Page 61)

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Lessors Want Some Changes in Federal RFP Procedure

(Continued from Page 59)

For instance, if an agency says its equipment will have a five-year system life, one lessor said he will give it a "very favorable rental rate, almost equivalent to commercial prices."

But he inserts penalty clauses so if cancellation occurs prior to the full system life, the agency in effect pays the rate for a lease of the shorter duration.

"A lot of people complain about [the lack of multiyear leasing funds], but I don't see the problem if they use the tools they have, such as the penalties," he said.

Jerry Israel, president of General Leasing Corp. in Rockville, Md., would like the government to mandate assessment of cancellation penalties throughout all agencies. Currently the practice is on an agency-by-agency basis, he said.

Several vendors said they would like to see wider acceptance of plug-compatible gear. "The government tries to specify plug-compatible peripherals, but it's nowhere near as good as it should be on that," Israel observed. He would prefer that the RFPs be left open to permit plug-to-plug peripherals.

The receptiveness toward plug-to-plug equipment varies among agencies, he added. "Army has made the most significant effort in permitting plug-to-plug compatibles; the Navy's been very, very slow, and the General Services Administration (GSA) has been all but impossible," he said.

Israel also pleaded for faster response in awarding bids. "GSA used to take 20 days to make a decision for a procurement when it agreed to work with third parties. It did beautifully for a year or year and a half.

"But the last nine months to a year it has been taking an average of, in my opinion, 90 days to make a decision. It's impossible to hold equipment for that long a period of time," he lamented.

Bids Without Maintenance

Three lessors indicated they prefer to offer bids without maintenance. Israel went even further and said bids should also be exclusive of software support.

For various reasons, including either of these two elements in a bid can restrict the number of bidders and in fact be used to direct bids toward certain vendors, several spokesmen observed.

One lessor said the GSA alone should have the right to restrict the number of maintenance vendors within a particular shop. Currently this is at the discretion of the individual agency or department.

On separating maintenance out of an RFP, Israel commented, "It's just as easy for the government to get it, and it has a larger ax to wield."

Another spokesman added, "This would allow the agency to procure maintenance from the federal supply schedule and eliminate maintenance pricing as a factor among those submitting bids."

A third spokesman said, "It's too hard for a lessor to pin down maintenance costs over the life of the system."

For instance, a lessor bidding a low maintenance price could well get caught in a squeeze when prices are raised by the maintenance supplier.

Conversely, if the lessor puts in a reasonable estimate of maintenance costs, the bid may appear higher than others, he said.

More Ground Rules

One lessor said he would like to see less leeway given to contracting officers in grouping items within a bid.

For instance, when procedures require that bidders contract to supply an entire group of equipment, one or two items not available to third parties will throw that group's contract to the original vendor, he said.

In certain cases, items should be broken out separately so the maximum savings can be achieved, he said. However, he acknowledged this advantage has to be balanced with the disadvantage of dealing with numerous contract awards.

"I've seen several bids where the groupings were not what I would call the most logical. But this is something that is not written up in regulations," he added, observing he would like to see some ground rules so when a lessor feels he's been "sandbagged" he can more effectively protest.

As of now, "it's judgment, and you can't really argue with that," he said.

There should be standardization of residual value calculations throughout government bids, Israel and others said.

The methods of calculating residual value vary tremendously, they added.

The government should also standardize the criteria by which an offer is judged to be balanced or unbalanced, some said. Currently the contracting officer has the discretion to call a bid unbalanced.

One element that pertains to unbalanced vs. balanced bids is purchase credits. One lessor requested that the government not accept rental credits in excess of 100%.

Although all agreed adequate delivery time after receipt of award is imperative, there was disagreement on the time needed to review specifications before submitting a bid.

While one vendor wants a month, others said this was unnecessary. "I don't think it does that much good ahead of time because everyone waits for the last three days anyway," one said.

"Right now they take too long. They give you 30 days and you only need about 10," Israel said.

"Reasonable" delivery times also vary. Thirty days for common peripheral gear isn't bad at all, one lessor said.

Mini Growth Rate Seen Slowing To 19% Annual Compound Rate

(Continued from Page 59)

The communications sector, ranked third in 1975 with a value of $67.2 million, will drop to sixth place, but the value will grow to $90 million.

Other growing application areas include specialized data and word processing, specialized data acquisition and instructional, CSI said.

Time Share 50%

In terms of domestic market share, three suppliers account for about 50% of the unit volume and nine suppliers account for almost 90%, the report stated.

"There are so many strong competitors with broad product lines and so many traditional applications nearing saturation that a new company is at a decided disadvantage," CSI noted.

"A new company will find the most likely way to carve out a niche in the market place is to offer a price-competitive product tailored for some specific applications," it added.

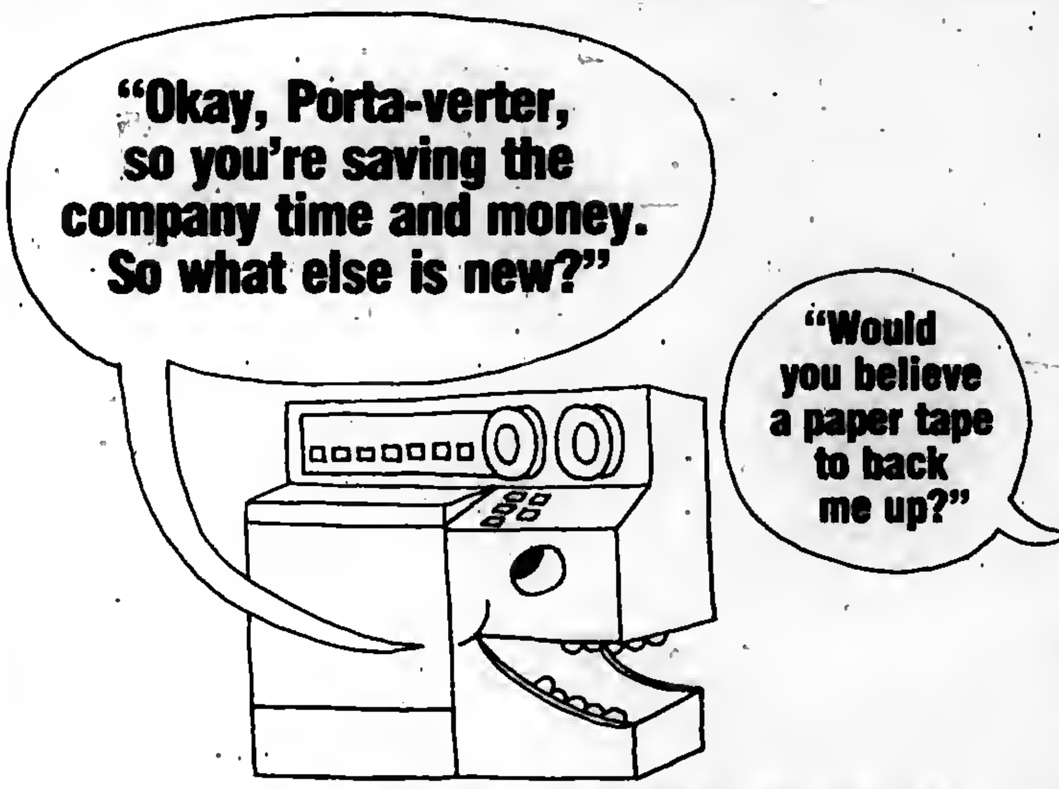
Other possibilities for entering the market would be large systems manufacturers integrating backward into minis; intelligent terminal suppliers who build processors packaging them as minis; or microprocessor manufacturers expanding their product lines to include minis, CSI said.

Breakthroughs in semiconductor processing are largely responsible for the rapid decrease in mini costs, the report observed.

The cost ratio of components has changed, the CSI report noted. In 1972, memory and logic constituted about 15% of the total cost of a minicomputer system; in 1975 they constituted about 5% of the cost; in the near future they will constitute probably less than 2% of the cost, CSI stated.

Associated hardware, including power supply, control panel and chassis, while dropping in cost, "will account for about 15% of the total cost of a minicomputer system in 1980 compared with 9% in 1972," the report found.

Peripherals, however, cost considerably more than processing power in a minicomputer system. The paper tape reader/punch, a moving-head disk and a printer are the most expensive items in a system, according to CSI.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'Balanced Approach'

Eclipse C/330 Shows DG Interest in Commercial Area

By Esther Surden
Of the CW Staff

SOUTHBORO, Mass. – With the introduction of the C/330 supermini model and its Interactive Data Entry and Access (Idea) software [CW, Sept. 6], Data General Corp. (DG) has demonstrated its commitment to a "balanced approach" in product announcements, according to President Edson D. de Castro.

The mini, which extends the Eclipse line upward, joins recent software, printer, memory and terminal announcements. The firm has also introduced an enhanced mid-range model Nova and the Micronova systems extending its offerings downward.

At present, the company is "very interested in the emerging commercial market," de Castro said, noting that for the moment the company is "trending toward much more sophisticated products in the marketplace.

"The customers we attract see real economies in tailoring systems to work in concert with their businesses," so DG is in no way trying to attract the first time user, he noted.

In fact, "we have no business going after the first time computer user," he noted.

"Our previous product introductions in the commercial area have responded to three customer needs: distributed processing, the growing demand for commercially oriented minicomputers and the increasing need for data base capability," de Castro said.

The new system responds to those needs, but also allows "easier implementation and use of minicomputer systems by sophisticated DP managers who must distribute DP capability to both decentralized and relatively unsophisticated users," he claimed.

The significance of the C/330 announcement, according to Rowland H. Thomas, vice-president of product marketing, lies in the software.

In the past, Thomas noted, "the flexibility provided by the C/300 and the Infos file management system required a rather high level of programming expertise, as well as a knowledge of Fortran."

The introduction of an Ansi-74 Cobol compiler six months ago broadened the firm's customer base, he added, by "allowing us to talk to certain of the Fortune 500-type companies that have large Cobol programming staffs."

The Idea software is expected to broaden the company's customer base further, Thomas said, by being attractive to companies who are "analyzing their skyrocketing program development costs."

The system should represent a way for these firms to reduce programming costs, he added.

At the same time the Eclipse with Idea software could be interesting to "the smaller companies which normally have a limited number of experienced programmers. For them, the Idea system makes possible much higher program development productivity from this limited programming staff," he said.

The system should also interest OEMs, he noted, because these companies are searching for ways to continually contain programming costs.

NCR Dundee Cuts 600 Employees

DUNDEE, Scotland – As the final phaseout of NCR's corporate plan to cease production of mechanically-based products, NCR Corp. plans to lay off 600 employees at its plant here, according to a spokesman.

Production of cash registers and accounting machines will cease, he said.

The firm has recently increased production schedules here and elsewhere for its computer and terminal products in response to an upturn in demand.

Agencies Ordered To Cut DP Costs

(Continued from Page 59)

over the next year along with estimated additional savings," the memo stated.

Agencies were also required to submit initial plans for increasing their reliance on the private sector.

By Sept. 21, agencies should review and revise their procedures for contracting out to ensure that "all in-house commercial and industrial activities are reviewed and terminated if not justified as an exception to the contracting out policy," the memo directed.

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Shugart Sees Concentration Key to Market Position

By Toni Wiseman
Of the CW Staff

SUNNYVALE, Calif. – Shugart Associates' concentration on the floppy disk drive market, rather than diversifying like California Computer Products, Inc. (Calcomp) and Control Data Corp.'s may well be the reason it is currently the leading manufacturer of flexible disk drives, according to W. Ferrell Sanders, Shugart's director of marketing.

There are six to eight serious competitors in the floppy market, but it is dominated by three or four companies, namely Shugart, CDC, Calcomp and Pertec or possibly Orbus, he said.

Since Shugart shipped its first floppy in September 1973, the company has gone from substantial losses the first year to a profit before taxes of $1.9 million for fiscal 1976.

"Shugart's corporate objective is to be the industry leader in low-cost OEM disk storage peripherals," he said.

"To this end we take great pains to ensure we are providing our customers with products that are soundly engineered to assure cost-effective value," he said, adding new products are generally in direct response to user requests.

The product line now consists of the SA800 line of standard floppy disk drives, the SA3800 floppy disk subsystem and the newly introduced SA400 minifloppy, designed to fill the performance gap between the large disk and the cassette.

Sanders estimated the total OEM market for IBM-compatible units would grow to $61.2 million by 1978 and $73.6 million by 1980.

Market revenues were $600,000 in 1973, $4.5 million in 1974, $15.2 million in 1975 and should more than double to $36 million this year, he said.

As a percentage of major domestic contracts (500 units or more), Shugart estimates its market share at 64%, Sanders said. Calcomp holds 12% of the market; CDC, 10%; and Pertec, 8%, he added.

Units valued at a total of $20.3 million were shipped through 1975, he said. Shugart's percentage of the total revenue during that period was about 50%; CDC followed with 14%; Calcomp, 13%; Pertec, 6%; Innovex, 6%; and Orbus, 5%, Sanders noted.

But in terms of total units shipped through 1975 the figures, at least in terms of Shugart and Calcomp, differed significantly, he said. Shugart accounted for 40% of the 50,000 units shipped during the period; Calcomp, 23%; CDC, 12%; and Pertec, 7%, he noted.

Sanders said he felt Shugart's market penetration success was due in part to its initial presence in the marketplace as well as to the primary emphasis the company places on floppies.

In addition, Shugart had a technical edge, he noted, since founders Al Shugart and a group of nine other engineers were responsible for developing the first floppy disk technology at IBM in the late 1960s.

They also pioneered several other disk recording innovations and the floppy disk product line introduced by Memorex before leaving to form Shugart Associates, he said.

"We stand a good chance to set the standard for minifloppies because of our market share and because we will be the first in the market with the product," Sanders said.

"We have indications that others in the industry are working on minis and are waiting for the final specs on our minidiskette. This means that it is very critical that our product work, and work well, as soon as it hits the market.

"If IBM comes out with a similar product, then that will be the standard; if not, Shugart's may well be the industry standard," he stated.

Commenting on the possibility of competitors marketing floppies of varying specifications, such as a 7-in. diameter rather than Sugart's 5.25-in. diskette, Sanders felt it would behoove others to follow the standard in order not to shut themselves out of the competition.

Sanders predicted sales would climb to $16 million next year.

Tymshare Picks Three To Head New Units

CUPERTINO, Calif. – Tymshare, Inc. has formed three marketing subdivisions specializing in information services, industry services and marketing support services and reassigned three vice-presidents to head the divisions.

The move is intended to accommodate the firm's growth and increasing specialization into selected industries and application areas, a spokesman said.

Robert L. Schwartz, vice-president and division manager of the Information Services Division, has established three geographic regions as well and expanded two specialized groups to national scope.

The groups are a telephone industry marketing unit and Tymshare's Application and Systems Consultants.

Executive Corner

G. Gary Myers was named vice-president and division manager for the Industry Services Division, which is responsible for serving specific sectors such as accounting firms, cable TV operators, fuel oil dealers, health care institutions and travel agencies.

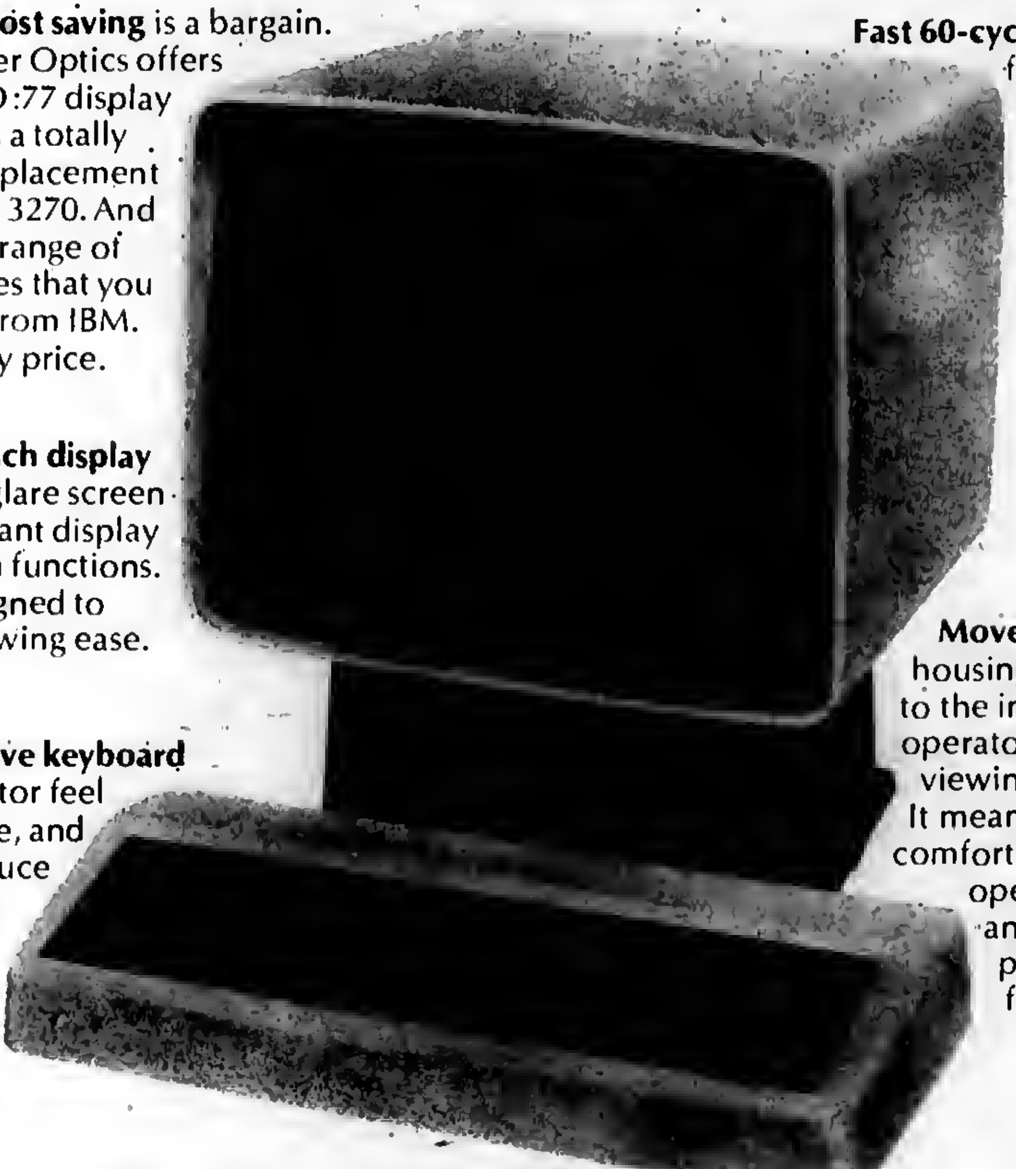
Walter J. Eissmann, now vice-president and director of marketing services, is responsible for product marketing and support, including training, documentation, terminal equipment marketing and sales development.

Horgan Resigns From Inforex

BURLINGTON, Mass. – Thomas B. Horgan, a cofounder of Inforex, Inc., has resigned as vice-president and director of that company.

Other Moves

- Ron Stephens has been named president of Xebec Systems, Inc.
- George B. Attig has joined Information Magnetics Corp. as vice-president and general manager of the Tape Head Group.
- J.J. Felcyn Jr. has been appointed vice-president/controller at Documation, Inc. and E.J. Cronin Jr. was named vice-president/administration.



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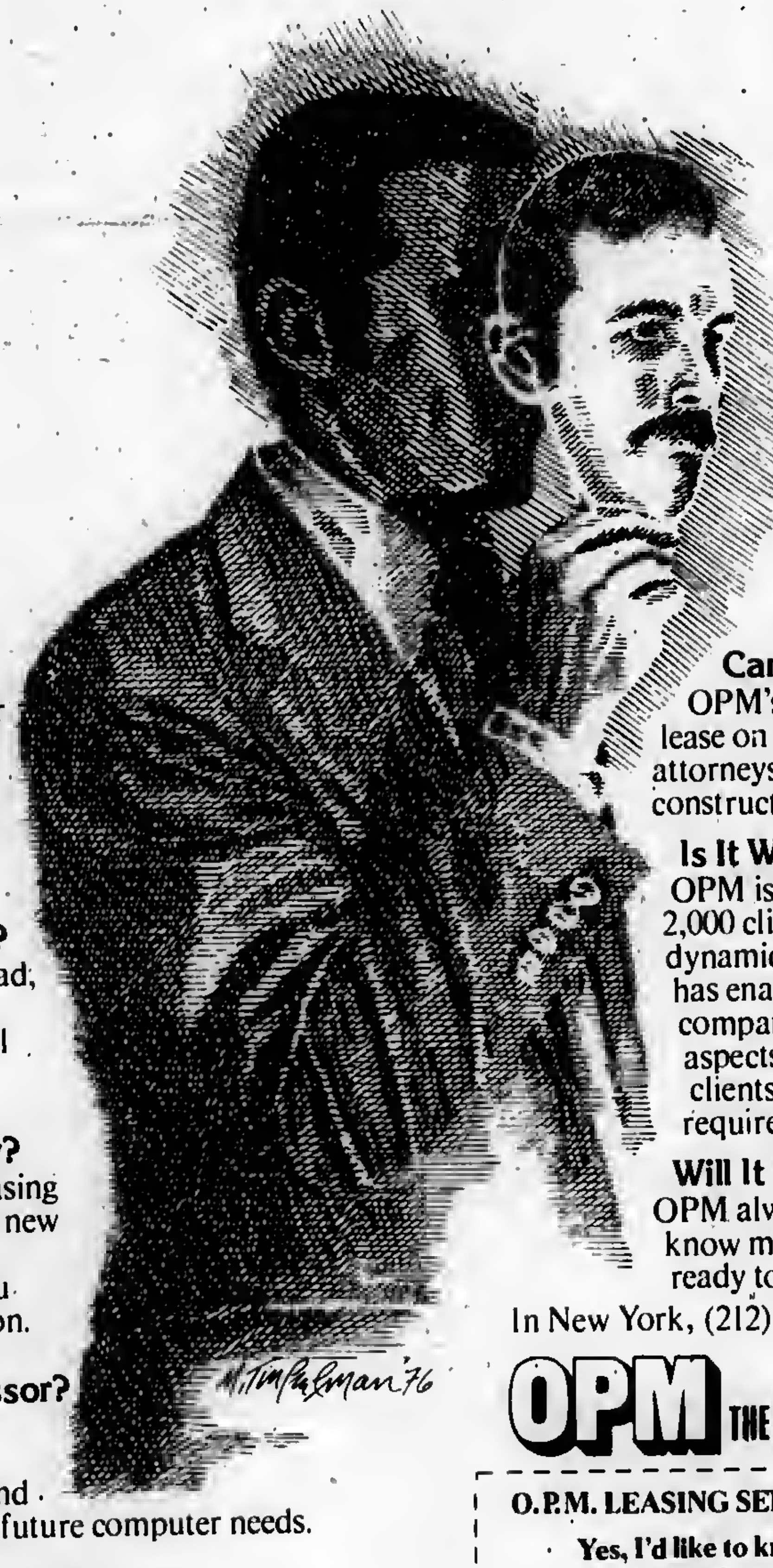

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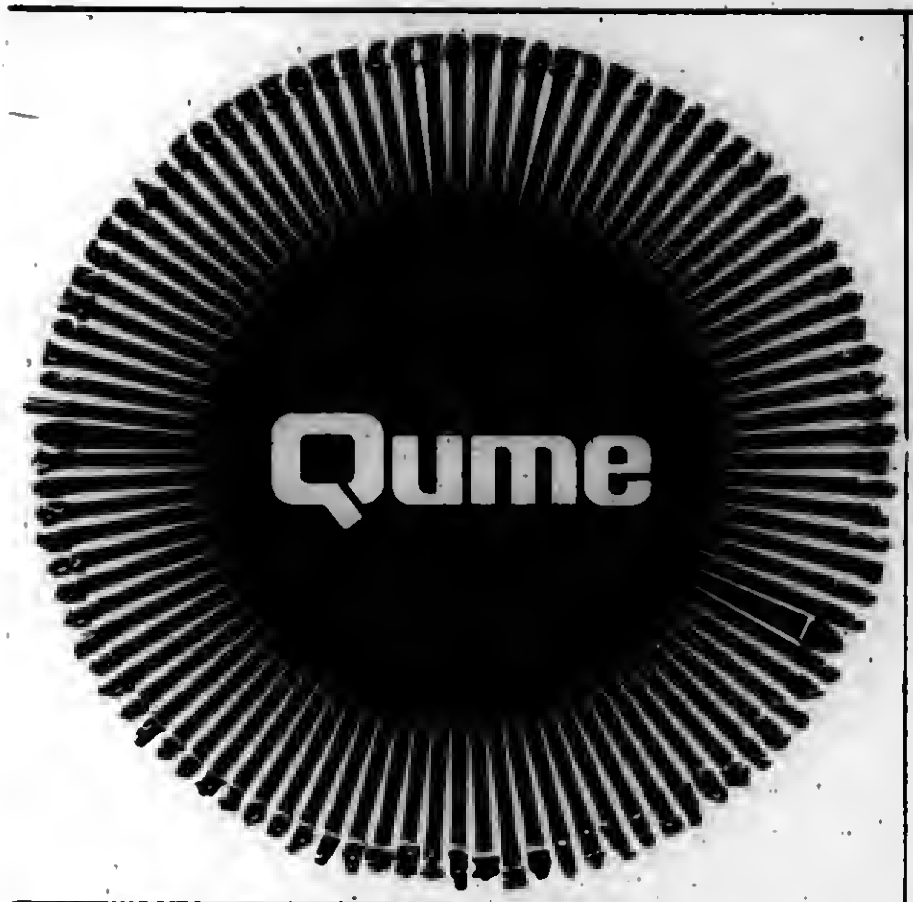

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Although Slow

POS Market Growth Starting in Europe

WALTHAM, Mass. – The point-of-sale (POS) market in Europe has been slow in taking off and continues to develop at a slackened pace, but growth is indeed beginning, particularly in the area of electronic cash registers (ECRs), according to *Autotransaction Industry Report* (AT/IR).

Comparisons between the U.S. and European markets are difficult since Europe has fewer and smaller chain operations and continental operations as a whole tend to be more decentralized with no dominating forces, the report said.

In the U.S., for example, 70% of POS business comes from chain operations, while in Europe only 30% to 40% comes from this area, AT/IR estimated.

ECRs

ECRs are the main area of interest at this point in Europe for several reasons: there is little need for credit authorization since many fewer checks are written than in the U.S. and credit card systems are still in their infancy.

In addition, because retail organizations in Europe are smaller and less affiliated and because scanning which requires minicomputer backup has not yet caught on, the market for on-line POS systems is substantially less dynamic than in the U.S., AT/IR said.

International News

"The total number of terminals installed in all aspects of European retailing, including such functions as stock control and warehousing, is put at about 37,000.

"Of that, 32,000 comprise the total installed base in Europe of electronic POS machinery, including the entire ECR gamut.

"About 17,000 of those terminals perform some sort of data capture and about half of those 17,000 are on-line POS terminals," AT/IR indicated.

In the on-line market, NCR leads with 4,800 installations, followed by Litton/Sweda with 2,000, IBM with 1,000 and ICL (previously Singer) with 250, according to AT/IR.

UK Firm's $50 Million Contract Said to Be From Saudi Arabia

By Ivan Berenyi

Special to Computerworld

LONDON – Since the end of last year, industry observers have been chipping away at the mystery surrounding a $50 million contract awarded to Scicon, a British software and consulting firm.

While Scicon could not divulge any details, an early leak revealed the government involved is Saudi Arabia.

"The project is to design, supply, install and operate an integrated computer and radio communications system on behalf of a Middle Eastern government department" was all a terse announcement said.

But reliable sources have since indicated the system would include 16 computers, almost certainly Digital Equipment Corp. PDP-11/40s, with centers in Riyadh and Jeddah accounting for four of the machines and the remaining 12 being scattered around the country's frontiers.

The hardware is said to amount to half the total figure given, but that almost certainly includes some sophisticated radio communications gear from another British company, Racal.

It is this Racal contribution, estimated at over $20 million worth of equipment, that has done most to firm up ideas about what the $50 million contract could be all about.

First theories relied heavily on the known predilection of the Saudis for "man management."

Getting into, or out of, Saudi Arabia is no easy task – specific visas are needed in both directions.

Communications in Saudi Arabia are very poor, and if the government loses track of the whereabouts of someone it wants to keep its eye on, it could be months before the trail can be picked up.

So, the theory ran, Scicon's contract is for a countrywide population control system to be based on passes, with its centers in the country's two population nodes and stations at the major border crossings.

Since then, however, a rival theory has emerged. This makes the contract a purely defensive measure.

Western architects leaving Saudi Arabia recently have let the fact slip that Riyadh now has an "Air Defense Center," and it seems entirely possible the computer system and radio gear could be part of a national air defense network.

The defense theory makes still more sense because Scicon's managing director, John Ockenden, let the fact slip that Scicon was already involved in negotiations with the Saudis for a further contract, related to the mystery $50 million job, but "something four times as large."

Miti Sees Biggest Market Growth Occuring in Large-Scale Systems

TOKYO – The Japanese Ministry of International Trade and Industry (Miti) has issued a five-year forecast stating that large-scale computers, with an average purchase price of $833,000 and up, hold the greatest revenue potential within the Japanese mainframe market, according to *EDP/Japan Report* (EDP/JR).

Miti estimated the total value of installed computers will increase from $7.627 billion to $18.2 billion over the next five years.

An estimated 65.8% of this additional value will occur in the large-scale class, Miti stated, with the user base growing from $4.46 billion in 1975 to $11.4 billion by 1980.

Miti cited several reasons for the anticipated growth, including the increasing requirements for large memory and communication management capabilities of corporate users as they become committed to data base and teleprocessing networks, according to EDP/JR.

While Miti predicted large-scale computers will grow from 58.5% of the installed value in 1975 to 62.7% in 1980, medium-scale computers will drop from 28.2% to 25.8% during the same period, with small systems dropping from 8.2% to 6.8%.

Foreign Orders & Installations

Swiss Postal Telephone and Telegraph Authority has ordered 4,800 bit/sec modems from Racal-Milgo Ltd. to upgrade its telephone directory inquiry service.

Mitsui Mutual Life Insurance Co. of Tokyo has ordered a Univac 90/60 system to replace two Neac 2200 systems.

BPM de Mexico S.A., a Mexican DP marketing organization, has ordered $750,000 of computer equipment from Century Computer Corp.

Banco Espanol en Londres S.A. has ordered two NCR Century 8200 minicomputers for an on-line banking system linking its London and Liverpool branches.

The Proctor and Redfern Group, a Canadian consulting engineering firm, has installed a Hewlett-Packard Model 3000CX system for on-line processing.

Hirosaki Mutual Bank in Aomori, Japan, has installed a Univac 1106 system as the center of an integrated on-line banking system linking 52 offices.

Iberia Airlines, Spain's national airline, has ordered intelligent terminals from Incoterm valued at $1.1 million.

Computer Facilities, Ltd., a British service bureau, has ordered an NCR Century 8200 minicomputer system as an initial step in providing on-line services.

Shell Oil U.K. has ordered 15 Micos turnkey systems from Mini-Computer Systems, Inc.

Macarthys Ltd., a British pharmaceutical distributor, has ordered 4,800- and 9,600 bit/sec modems from Racal-Milgo Ltd.

Esco Computing Ltd., a Scottish service bureau, has ordered a Univac 90/60 system.

Cadapso Gives Approval to White Paper Limiting DP Services Offered by Banks

TORONTO – A white paper by the Canadian Finance Minister has proposed restricting banks from selling DP services and limiting bank ownership in DP firms to a maximum of 10%.

The Canadian Association of Data Processing Service Organizations (Cadapso) sees the government white paper as "a strong endorsement of the stand the computer services industry has taken," according to Cadapso President Richard G. Taylor.

In addition to limiting ownership, bank-offered DP services would be limited to the making of payments, classification of deposits and payments, check reconciliation, preauthorized debits and credits, payroll preparation plans, or DP in connection with a factoring service.

The white paper expressed concern about possible unfair competition, concentration of economic power and conflict of interest if banks were to operate "both as commercial lenders and as sellers of computer services."

It further noted that most computer service companies in Canada are small, operate on a local or regional scale and compete successfully with foreign-owned companies.

"It is noteworthy that the white paper makes a point of stating that Canadian independent data processors will be able to meet the growing demand for data processing services in Canada," Taylor said.

International News

"It also observes that our industry has competed successfully with foreign-owned companies and that control of the industry will remain in Canadian hands.

"We have regarded the issue of unfair bank entry as one which was crucial to the survival of an independent, Canadian-controlled computer services industry. The decision of the federal government to opt for a vigorous and self-reliant industry reflects our judgment that wc are best equipped to meet the needs of computer services users," Taylor said.

For the banks, the proposal would mean they will be prohibited from engaging, directly or indirectly, in DP services such as small business accounting.

Small Business System Installations Seen Doubling by 1980 in Germany

FRANKFURT, Germany – Installations of small business computers in Germany, now about 80,000, will double by 1980, according to Dr. Hans-Joachim Grobe of Diebold Deutschland GmbH.

The entrance of IBM into this market has caused mixed feelings among the established firms, Grobe pointed out. On the one hand they accept the "consecration" of their market; on the other hand, they fear the "mighty competitor."

Grobe highlighted an important difference between American minicomputers and German small business systems: The great success of the systems in Germany is based on the wide systems support the manufacturers provide.

The vendors offer a wide range of application software packages, easily adaptable to users' individual needs, whereas U.S. attempts to enter the field of commercial applications are still in their infancy, he said.

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Services to Play Big Role in CDC's Financial Future

NEW YORK – With "good improvement" expected for Control Data Corp.'s second half and 1976 earnings, computer services are expected to play an increasing role in CDC's projected revenue growth during the next few years, company officials recently told analysts here.

Total revenues are expected to grow to $3 billion by 1981 compared with $1.9 billion last year; the portion contributed by computer services should grow to 33% compared with 24% last year, Chairman William C. Norris said.

Looking at the four major components' revenue contributions last year, Norris said Commercial Credit accounted for 35%; computer systems, 24%; computer-related services, 24%; and computer peripheral products, 17%.

In 1981, the breakdown will be approximately one-third computer services, one-third financial services and one-third equally divided between computer systems and peripheral products, he added.

"Clearly it is the computer services business that will lead the expansion. In 1975, our computer-related services business contributed about $450 million of revenue," Norris said.

"In the current year; 1976, this should rise about 12% to about $500 million," he added.

"I would expect computer services to double by the end of 1981 and approach $1 billion," he continued.

There are several reasons why CDC is so interested in the services market: a rapid growth rate has been projected for the next five years; services promise a greater return on capital employed; and the firm has built up a "substantial body of expertise" in this area.

In addition, Commercial Credit's "position in consumer and commercial markets will further enhance our computer services strategy," he said.

CDC's integrated services marketing approach offers both Commercial Credit financial and insurance services as well as CDC education and other data services to specific target markets.

Looking at the international scene, both present and future, Norris berated U.S. government policy for thwarting growth in this area.

CDC's international business currently accounts for about one-third of its computer business revenues, he observed.

"The areas of opportunity abroad include the Soviet Union and Eastern European countries where, depending on U.S. policy, there is an $8 billion to $10 billion potential cxport market for U.S. computer companies over the next 10 years.

"If our government would take a more rational export view, U.S. computer companies by 1985 could be making sales to these countries in excess of $2 billion per year – 100,000 jobs by 1985.

"By way of comparison, this is about the same number of jobs as in the U.S. semiconductor industry," Norris said.

Marvin G. Rogers, senior vice-president of finance, told analysts the firm plans to achieve a "gradual but sustainable improvement in profitability" over the next several years.

For 1977, he expects computer services revenues and profit levels to improve. Earnings should be higher from computer systems because of a greater number of Cyber 170s in its lease base.

The peripheral products operations should turn in improvements because of improving order rates, he said.

And Commercial Credit should contribute increased earnings both as a result of improvement in the insurance business and from higher levels of cash employed in financial services, Rogers said.

As an indication of the firm's asset management program, Rogers said last year total debt was reduced $83 million. Also, revenue per employee, which was about $30,000 in 1974, rose to $36,000 in 1975, he said.

Computer business debt is expected to remain about level over the next few years, he said, adding he expects increased intercompany financing.

Debt to equity in computer business should decline to a ratio of 1:1 compared with about 2:1 at the end of last year, he said.

Profligacy repealed:

Read our special report on *Supplies and Security* in the September 27th *Computerworld*.

Harry S. Truman, in his oft-quoted phrase on our improvident ways, admonished us to "Use it up, wear it out, make it do, or do without." As much as it made sense to the sugar-saving housewives of 1946, that wartime motto is excellent advice for the computer rooms of today. Our September 27th supplement, titled *Supplies and Security*, takes that advice, and we'll show you some innovative ways to save money by conserving supplies.

Edited by Drake Lundell, this Supplement will cover all the things you feed your computer system, including tapes, disks, cards, paper and forms. Miniaturization of the supplies you use has the added benefit of saving storage space as well as using less material -- and this supplement will examine equipment that does this, such as computer output microfilm and photo-reducing copiers.

We'll also address the subject of security in this report. Diabolical threats like dust, excess humidity, fires, floods, theft or sabotage could bring your computer operations to a grinding halt. We'll review the risks -- especially in the area of physical security -- and report on ways you can reduce your exposure to them.

Anyone who manages computer systems will find important and useful information in our September 27th supplement.

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ESE Forms Unit

WELLESLEY HILLS, Mass. – ESE Ltd. has formed a subsidiary, ESE Electronic System, Inc., to market and support its telephone traffic data analyzer in the U.S.

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Two Observers Predict

Service Industry to Pass $9 Billion Mark by 1980

COLUMBUS, Ohio – The computer services industry will grow from annual revenues of nearly $4 billion in 1975 to over $9 billion in 1980, two computer industry observers said here recently.

Gilbert Mintz, president of Broadway Associates, a financial consulting firm, told analysts the rapid and fairly stable growth of the industry warrants investor attention.

"This industry is legitimized. It has credibility and should be given a serious look by the investment community in the future," Mintz said.

Peter Cunningham, president of Input, a computer services consulting firm, explained that "increased complexity and costs of internal DP are reasons why more companies across the country will increase their use of the computer services industry to meet their internal needs.

"In many cases the industry is providing all DP support for a client and may even operate a computer on-site for that client," he said.

"Today there are a large number of firms in the computer services industry doing very well regarding profits," he added, "and by 1980 there will be several doing over $500 million each year."

Reasons for Growth

Outlining reasons for the continuing growth of the industry, Cunningham said "it has become the lifeblood of many companies. Businesses have become very dependent on the services industry to solve problems.

"Second, there's a better understanding of the computer services industry and what it can do for businesses. And the time value of information to companies is ever-increasing. The computer services industry can provide needed information at the fingertips of a company's management staff."

Mintz said the stability of the computer services industry has made it attractive to the investor. "The industry's continuing revenue base is a tremendous asset because you can predict that the next year's revenues will be higher than the past year's," he noted.

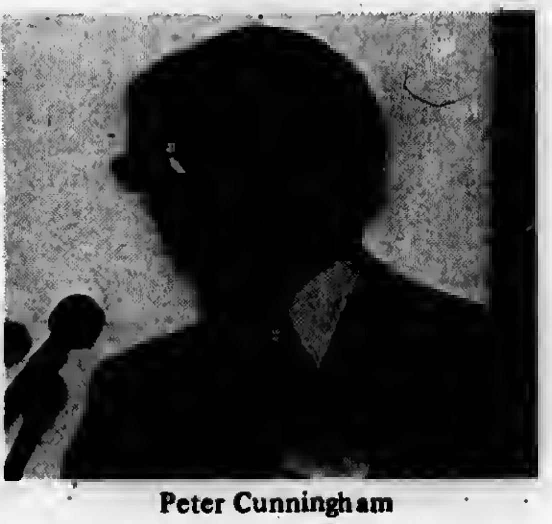
"There is also good cash flow in the industry, few inventory problems and few seasonality factors; we can anticipate our work flow very accurately and plan for it very effectively," he added.

The computer services industry is also somewhat resistant to economic cycles, according to Mintz.

"In 1974, one of the worst recessionary periods in recent history, the computer services industry continued to grow at a 15% growth rate," he said. "Other reasons for the industry's attractiveness include results at a known cost, companies' increasing desire for all kinds of economic information and a very powerful inertia factor," he said.

Gilbert Mintz

"Once people begin to use the services, they become somewhat narcotic. The old skills vanish and companies just continue using the new services provided by this industry."



Peter Cunningham

In addition, Mintz said, "manpower is getting more expensive while the services of the computer services industry are getting less expensive; thus, to most companies, the industry means a substantial bargain."

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Contracts

HP Picks Dataproducts

WOODLAND HILLS, Calif. – Dataproducts Corp. has received a contract from Hewlett-Packard Corp. (HP) for the supply of printers ranging from 300- to 1,800 line/min.

The contract, which is the largest between the two firms, could represent $15 million in shipments, including spares, over three years, Dataproducts said.

The printers will be used with the HP 3000 Series II as well as the 9600 minicomputer, Dataproducts said.

Other Awards

Pfizer Medical Systems, Inc. will use Ramtek Corp.'s RM-9100 Medical Imaging Display Systems in its Acta-Scanner whole-body computerized tomographic scanner.

Applied Data Communications has selected Pertec Corp. to supply it with rigid and flexible disk drives. Deliveries extend through November 1977.

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Oil, gas, chemical, or distribution company experience preferable. Overseas experience or French language ability a plus. Hardware: IBM 360/70-OS, Sigma 5 or 7. Languages: ANS-COBOL, Fortran, PL/1. Advanced degree highly desirable. Experience, Minimum of 2 years but openings exist at several levels of experience. Send resume with current earnings to:

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PROGRAMMER/ANALYST

- Strong IBM Assembler language background
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East: Boston (617/237-3120), New York-New Jersey (201/687-8700), Philadelphia (215/665-1717), Washington, O.C. (703/790-5610).
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STATE OF NEW MEXICO

The centralized data processing department is filling the position of director. incumbents must have 10 years of varied data processing experience of which at least 5 years have been in a management capacity in a large scale IBM shop. (OS or OS/VS environment). Incumbent will be responsible for all aspects of data processing including procurement, budget, planning, systems development and operations. Current hardware is 370/158 and 370/145: staff numbers 140. Salary negotiable. Send resumes and salary requirements to: Ralph Trigg Oept. of Automated Oata Processing PERA Bldg. Rm. 103 Santa Fe NM 87503.

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PROGRAMMER ANALYSTS

with 2 to 4 years of actuel programming, COBOL; systems design and user contact.

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Resumes MUST contain current salary and minimum salary requirements. Sent resumes to:

John Sullivan, Associate Director
SouthWestern Ohio Regional Computer Center
University of Cincinnati
231 Bethesda Avenue
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2223 West Loop South, Suite 400
Houston, Texas 77027

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has immediate openings for data processing professionals at their large scale multiple CPU Center in Arlington, Virginia.

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Degree and 1 year systems programming or equivalent experience of 3 years in SVS Control Programs Support on IBM Hardware.

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Minimum 2 years experience on System 370 OS/VS/VM or PARS.

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Degree and minimum of 1 year experience.

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Both positions will utilize past experience working with CDC 6000 or 7600 computers. Salary range, both positions $16,440-$25,140 yearly.

Submit resumes to Dorita Crosby
Employment Office
LAWRENCE BERKELEY LABORATORY
Berkeley, CA 94720

LAWRENCE BERKELEY LABORATORY

A world-wide leader in the offshore engineering and construction industry has positions available in the Systems and Operations Department of its New Orleans Office.

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Responsibilities include definition, organization, protection and documentation of Company Data Base activity as well as strong user interface. Knowledge and experience in COBOL, PL/1 and IMS/VS data base dictionary implementation required. CICS/VS knowledge helpful.

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Senior Level Systems Programmer with extensive experience in HASP, VS 2 (SVS), and teleprocessing desired.

Both positions require a BS in related disciplines and 3 to 5 years programming with limited systems design and analysis work experience. These positions offer an excellent salary and fringe benefits package.

Please submit resume including salary history in confidence to Bruce Bernard

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San Francisco Bey Area positions Include JUNIOR PROGRAMMERS (1-2 years' experience) through SENIOR ANALYSTS with current axperlence on mini computers, end relatad operating systems. Senior positions require experience in design and implementation of real-time systems in areas of Command and Control, data collection Mission/Resource management and planning, and/or high-speed communications data collections networks. Experience in distributed processing, distributad deta bases utilizing netted minicomputer system architecture desireble.

We invite qualified candidates to send their rasuma end salary history/requiraments to Professional Employment, Dept. JJL-3

Aeronutronic Ford

Aeronutronic Ford Corporation

Western Development Laboratories Division
3939 Fabian Way
Palo Alto, California 94303
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Computer Engineers

Systems and Software

The Point-of-Sale Terminal Systems is an expanding market for computer industry and, accordingly, highly competitive. To maintain NCR's lead position in the field, the P.O.S. Division requires the talents of experienced Systems Engineers and Software Engineers with mini and microprocessor exposure. Below are just samples of current professional opportunities – there are a number of others for which you might well qualify and be interested in pursuing. We invite you to send your credentials, including your area of work interest, for consideration.

SOFTWARE SYSTEMS ENGINEERS

To define and develop overall total systems level software erchitecture required for future terminal control systems (retail). This will include operating system software, system level simulations, system level diagnostics, and communicetions (from the Point-of-Sale through the "host" processor).

SR. SYSTEMS ENGINEER

To be responsible for total systems design for Point-of-Sale terminel. Will conduct evaluation of system requirements and development of the technical approach. Experience in application of mini/micro computers to real-time, interrupt drivers processing requirements. Must be capable of performing hardware/software tradeoff evaluations as well as analyzing hardware and software designs and resolving conflicts.

SYSTEMS ENGINEER

To plan and coordinate the development of systems software architecture for real-time microcomputer system and the telecommunications software for both minicomputer and large scale computer systems. Perform analysis and systems design including hardware/software tradeoffs with emphasis on softwara implementation. Will be coordinating with marketing to determine customer needs and requirements relative to Point-of-Sale systems and telecommunications. Knowledge of high level langueges – (FORTRAN, COBOL, etc.) and of telecommunications disciplines – VTAM, BTAM, bisync, etc. Operating systems knowledge and experience desirable.

SYSTEMS DESIGN ENGINEERS

To analyze both hardwara and software designs to guide effective system tradeoffs and determine system performance based on hardware/software constraints. This individuel will provide design support to the product development groups.

An experience level of from 2–10 years plus an appropriate engineering/technical degree (BS – MS) will provide the basis for consideration. And as soon as you reply – so will we.

NCR

Robert W. Donovan
Terminal Systems Division -- Cambridge
NCR Corporation
Cambridge, Ohio 43275

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DATA PROCESSING OPPORTUNITIES

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COBOL, DOS/OS. to $13,500 +

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1-2 years experience, degree a plus. IBM 370/155/158, COBOL, ASSEMBLER, DOS/VS, OS, Business Applications. IMS, DL-1 helpful. to $16,000

Programmer Analysts
COBOL/FORTRAN, OS, ASSEMBLER, IMS, DL-1. to $18,500 +

Senior Programmer Analysts
COBOL, FORTRAN, DOS/OS, IMS, DL-1, Varied Applications. to $19,200 +

Software Specialists (To Senior Positions)
IMS, DL-1, ASSEMBLER, Scientific, Business, or Manufacturing. SYSGEN, TCAN, HASP. to $21,000

Consulting Analysts (In House)
Design and Implementation, COBOL, PL-1. And Varied Applications. to $22,000 +

Systems Analysts
370/158/168. Design and Implementation. COBOL, PL-1, Business or Manufacturing Applications. to $21,600 +

Senior Systems Analysts
370/155/148. Design and Implementation. Banking/Business Applications. to $22,000 +

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360/370, COBOL/High Level Languages, Modeling, Troubleshooting, debugging. Strong ability to establish client needs, follow through, and work on own; initiative a must. Some travel within St. Louis Metro Area. to $22,000 +

This is ONLY a partial listing of the Data Processing opportunities available. If you are interested in these challenging positions call NOW or rush resume and let's get together.

james franklin & associates

Human Resource Consultants

Data Processing Division
502 Earth City Pleze, Suite 120
Earth City (St. Louis), Mo. 63045
(314) 291-6880

Professional Nationwide Search. Client Companies assume fees.

position announcements

Programmer Analyst

Old Dominion University invites applications for a Computer Analyst/Programmer on a three year NSF-funded project for the improvement of science education with possible continuation beyond the duration of the grant with the University Computer Center. Candidates should have a B.S. in Computer or Physical Sciences, at least two years of experience in the creation and maintenance of computer assisted and computer managed instructional software as well as experience with the DEC system-10 or other major time-sharing systems and University computer facilities. Salary range is $13,500 to $15,000 depending on experience. Candidates should forward resume and two letters of reference to Dr. Dennis A. Darby, ODU-CAUSE Coordinator, Dept. of Geophysical Sciences, Old Dominion University, Norfolk, Va. 235d8. *Old Dominion University is an equal opportunity affirmative action employer.*

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Mgrs. Syst & Progrmg Min. 2 years Mgmt.	$18-26K

For further information on these and other positions, send resume in strict confidence to:

Mark Fuller
CADILLAC ASSOCIATES, INC.
32 W. Randolph St.
Chicago, IL 6d601
(312) 346-9400

Data Base Administrator

City of Flint is recruiting for a Data Base Administrator, Salary $17,299-$21,442. Requires education equivalent to Bachelor's Degree in Computer Sciences, Business Administration, math or related field and at least 5 years experience in systems design and analysis, programming and operations with at least 3 of the 5 years in a position of administrative responsibility in a data processing installation using a Data Base Management System — use of Cincom Systems, Inc. Additional experience may be substituted year for year for each year of required college.

Applicants should apply City of Flint Personnel Office, City Hall, 11d1 S. Saginaw, Flint, Michigan, 48502. Attention: Myre Fry.

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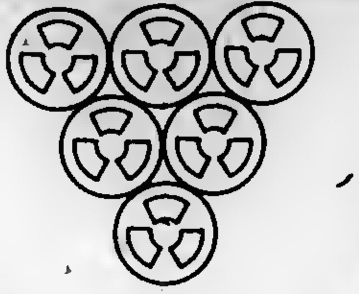

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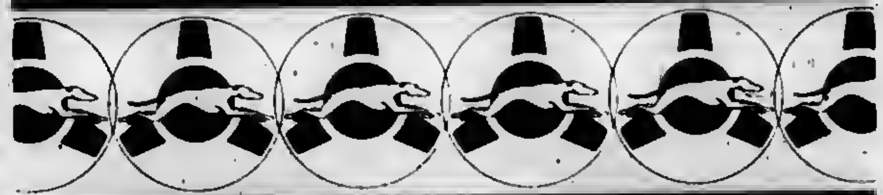

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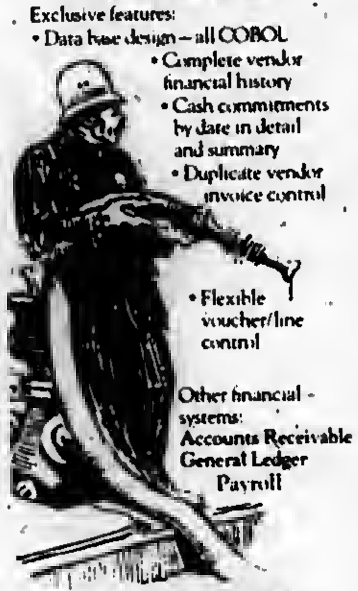

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REI Results Improve in Nine Months

DALLAS – Recognition Equipment, Inc.'s (REI) earnings and revenues rose both in the third quarter and nine months ending July 31.

The firm has begun shipments of its optical character recognition (OCR) wands under a $15 million contract, delivering $1.4 million during the third quarter.

Another $2.4 million of wands Is expected to be delivered by the end of the fiscal year in October, the firm said.

During the quarter, revenues rose to $15.6 million compared with $13.5 million in the same period last year.

Earnings totaled $1.2 million or 21 cents a share compared with $733,000 or 12 cents a share in the year-ago quarter.

Nine-Month Results

During the nine months, revenues rose to $48.8 million compared with $42.5 million in the same period last year. These figures include revenues from noncancellable long-term leases treated as sales of about $6 million and $3.4 million respectively.

Including a tax credit of nearly $1.5 million, earnings for the nine months rose to $4.2 million or 71 cents a share compared with $2.1 million or 36 cents a share in the year-ago period, when the tax credit totaled $965,000.

Backlog of firm orders for lease and purchase rose to $45.2 million from $41.5 million a year earlier, boosted by the remaining $13.6 million of wands to be shipped.

The purchase value of equipment shipped during the first nine months reached $25.1 million compared with $19.1 million a year ago.

CA Year Earnings Double

IRVINE, Calif. – Computer Automation, Inc.'s (CA) 1976 earnings more than doubled, rising to a record $3.1 million or $1.60 a share compared with $1.2 million or 70 cents a share in 1975.

Revenues for the year ended June 27 grew 42% to a record $30.4 million compared with $21.4 million. Pretax income was 20% of revenues compared with 11% for the prior year.

The record earnings were attained despite start-up costs for the firm's Syfa distributed data processing system being handled by the firm's Commercial Systems Division, according to President David H. Methvin.

During the fourth quarter, earnings more than doubled to $885,000 or 46 cents a share compared with $392,000 or 22 cents a share in the same period last year.

Revenues jumped to $8.1 million compared with $5.8 million in the year-ago quarter.

The firm plans to double its production facilities next year.

Milgo Net Cut in Half

MIAMI – Milgo Electronic Corp.'s nine-month earnings dropped to half of those in the same period last year.

Revenues for the period were off to $29 million compared with nearly $30 million in the year-ago period.

Earnings dropped to $1.4 million or 82 cents a share compared with $3.3 million or $1.94 a share in the nine months ended Sept. 30, 1975.

The 1975 figure Included $415,000 from Racal Electronics Ltd. for adjustments in the Racal-Milgo agreement.

During the quarter, revenues rose to $10.1 million compared with $9.3 million while earnings dropped to $532,000 or 30 cents a share compared with $861,000 or 51 cents a share in the same period last year.

Nickels & Dimes

Prime Computer's revolving credit line with First Pennsylvania Bank has been increased by $3 million, bringing the total to $10 million. The expiration date has been extended one year to Dec. 31, 1978.

$$$

National Semiconductor expects sales and earnings for the first quarter which ends Sept. 19 to be below those of last year's fourth quarter because of manufacturing problems with its semiconductor digital watch components which are resulting in reduced output.

$$$

The Palmer Organization has invested $250,000 in Sigma Four, which was founded in December to develop, manufacture and market telecommunications equipment.

$$$

Cubic declared its second semiannual dividend of 14 cents a share payable Sept. 20 to holders of record Aug. 20.

$$$

Western Union International raised its regular quarterly dividend to 20 cents a share payable Sept. 13 to shareholders of record Aug. 13.

$$$

Mansgement Assistance, Inc. has authorized a special shareholders meeting to approve an amendment to the company's Certificate of Incorporation which would effect a one-for-four reverse stock split of its common stock.

$$$

Federal Screw Works' directors have voted a 100% stock distribution, raised the quarterly cash dividend rate 20% to 18 cents and declared an extra cash dividend of 40 cents a share, all payable Sept. 15 to holders of record Sept. 3.

$$$

Automatic Data Processing's common stock has been admitted for trading on the Midwest and Pacific Stock Exchanges.

$$$

National Computer Systems has declared a quarterly dividend of 5 cents a share payable Sept. 28 to holders of record Sept. 3.

$$$

Computer Optics has signed a lease financing agreement with Funding Systems Corp. providing for Funding Systems to purchase, over a three-year period, up to $10 million of Computer Optics' equipment covered by firm-term leases of three years or longer.

$$$

Quotron Systems has arranged for a term loan up to $6 million from First Pennsylvania Bank.

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With its conversion to Burroughs 9243 high-speed printers last July, Bankers Trust check processing section completed a strategic move to faster processing of check reconcilement listings. The problem was that higher lpm speeds and skip rates were causing continuous forms to misfold and tangle, requiring as much as 15 min. per operational printer hour to clear by hand. Printer downtime was creating costly delays in processing check listings.

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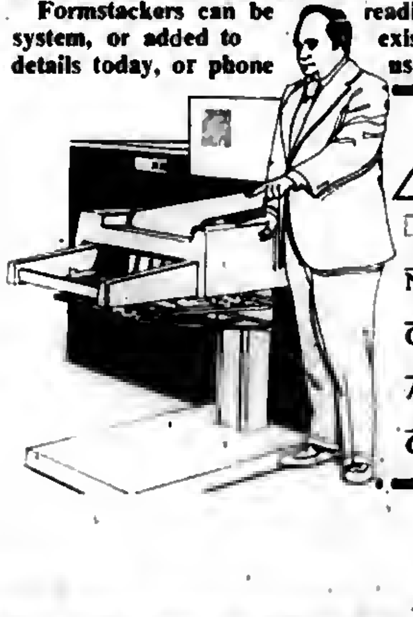

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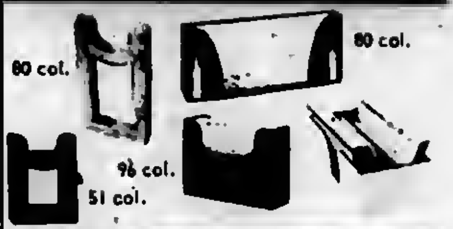

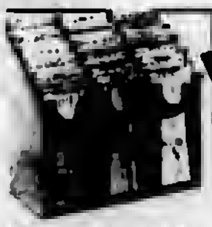

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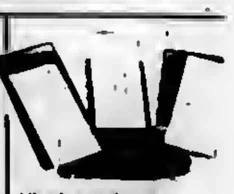

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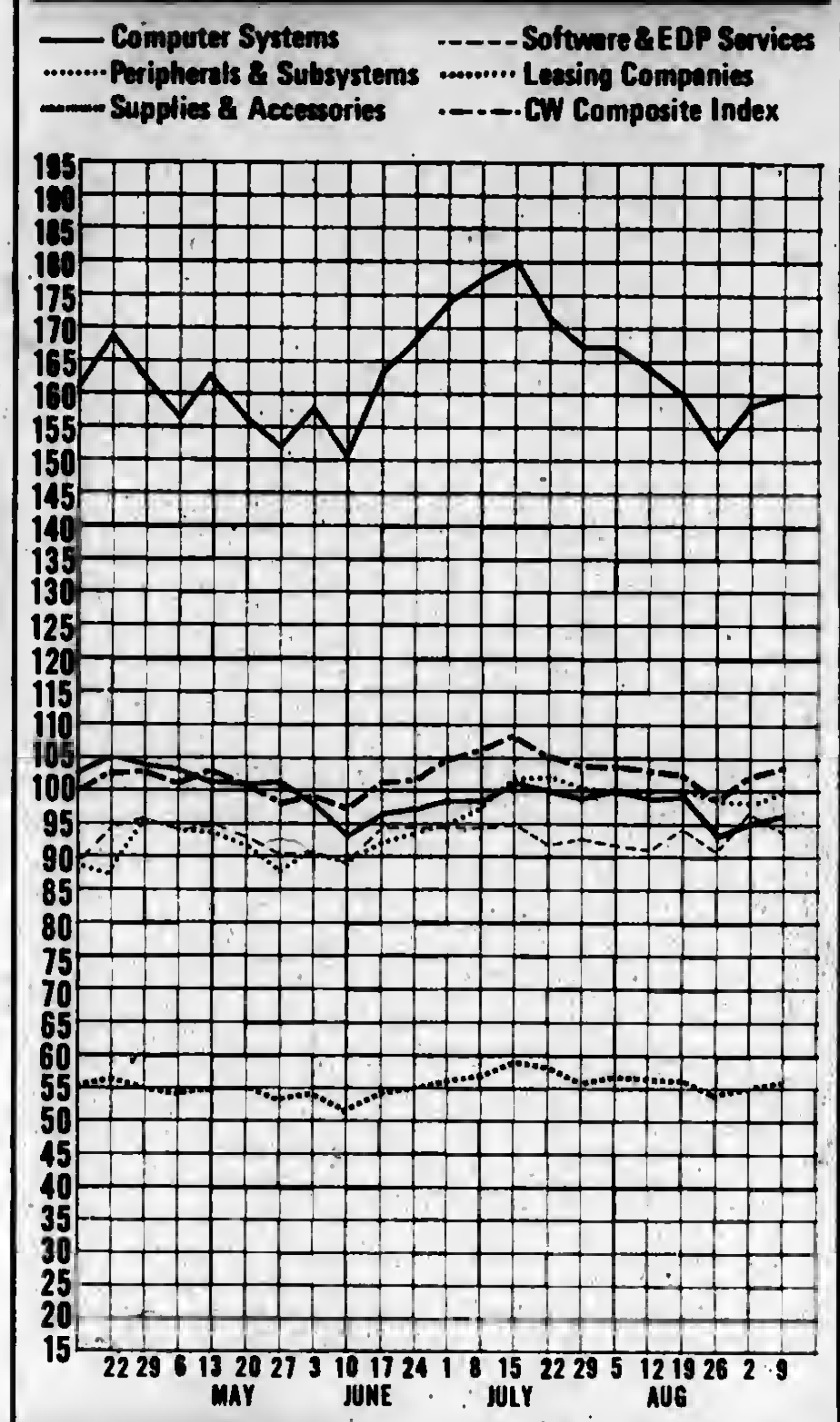

Earnings Reports

NATIONAL DATA COMMUNICATIONS
Three Months Ended April 30

	1976	1975
Revenue	$619,551	a$582,383
Spec Chg	.....	b22,634
Loss	59,710	38,778
6 Mo Shr	.....	.02
Revenue	1,101,245	a1,256,687
Tax Cred	.....	9,165
Earnings	(228,884)	30,857

a-Restated. b-Adjustment to tax-loss carryforward.

ON-LINE SYSTEMS
Year Ended April 30

	1976	1975
Shr Ernd	$.97	$1.50
Revenue	11,957,027	11,433,706
3 Mo Shr	.42	.10
Revenue	3,662,925	2,400,176
Earnings	356,251	82,599

SCAN-DATA
Three Months Ended March 31

	1976	a1975
Shr Ernd	$.01	$.05
Revenue	3,287,408	2,476,446
Tax Cred	3,600	26,600
Earnings	16,528	76,133

a-Restated.

VANIER GRAPHICS
Year Ended March 31

	1976	1975
Shr Ernd	$.76	a$.94
Revenue	26,347,743	21,279,370
Earnings	817,531	979,471

a-Adjusted to reflect three-for-two stock split in July 1975.

WYLE LABORATORIES
Three Months Ended April 30

	1976	1975
Shr Ernd	$.25	$.11
Revenue	35,167,000	28,992,000
Earnings	885,000	381,000

WYLY
Three Months Ended March 31

	1976	a1975
Revenue	$15,991,000	$15,654,000
Disc Op	.....	711,000
Loss	5,182,000	2,594,000

a-Restated.

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, SEPTEMBER 8, 1976

All statistics compiled, computed and formatted by
TRADE★QUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		1976 RANGE (1)	CLOSE SEP 8 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	84-108	93 3/4	- 1/8	-0.1
O	COMPUTER AUTOMATION	10- 19	17 3/8	+ 3/8	+2.2
N	CONTROL DATA CORP	18- 27	23 3/4	+ 1/2	+2.1
N	DATA GENERAL CORP	40- 69	49 1/2	+ 3/4	+1.5
O	DATAPOINT CORP	24- 46	38	+2	+5.5
O	DIGITAL COMP CONTROL	2- 7	5 3/8	0	0.0
N	DIGITAL EQUIPMENT	138-181	168 3/4	+5	+3.0
N	ELECTRONIC ASSOC.	2- 5	2 5/8	+ 1/8	+5.0
A	ELECTRONIC ENGINEER.	7- 16	9 3/8	+ 7/8	+10.2
N	FOXBORO	28- 47	45 5/8	- 3/4	-1.6
O	GENERAL AUTOMATION	5- 11	6 3/4	- 1/4	-3.5
O	GRI COMPUTER CORP	1- 1	5/8	0	0.0
N	HEWLETT-PACKARD CO	85-117	91 1/2	+ 3/4	+0.8
N	HONEYWELL INC	34- 56	45 1/2	+ 1/4	+0.5
N	IBM	227-280	277	+ 1/8	0.0
O	MANAGEMENT ASSIST	1- 3	1 5/8	-	-3.5
O	MEMOREX	18- 33	20 1/8	-2 3/8	-10.5
O	MICRODATA CORP	10- 27	27 3/8	+1 3/8	+5.2
O	MODULAR COMPUTER SYS	5- 14	4 1/2	- 1/2	-10.0
N	NCR	24- 36	36 1/4	+2 3/8	+7.0
O	PRIME COMPUTER INC	4- 14	13 3/4	+1 3/4	+14.5
N	PERKIN-ELMER	19- 27	22 5/8	+1 3/8	+6.4
N	RAYTHEON CO	45- 66	62	+2 1/2	+4.2
N	SPERRY RAND	40- 52	48	+ 1/2	+1.0
O	SYCOR INC	19- 31	21 1/2	- 1/2	-2.2
A	SYSTEMS ENG. LABS	6- 10	7 3/8	+ 3/8	+5.3
N	VARIAN ASSOCIATES	13- 17	14 1/4	0	0.0
A	WANG LABS.	11- 20	16 3/4	+ 1/4	+1.5

LEASING COMPANIES

EXCH		1976 RANGE (1)	CLOSE SEP 8 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMDISCO INC	3- 10	7 3/4	+ 1/4	+3.3
A	COMMERCE GROUP CORP	2- 3	2 1/8	- 1/4	-10.5
A	COMPUTER INVSTRS GRP	1- 3	1 5/8	- 3/8	-18.7
M	DATRONIC RENTAL	0- 1	1 1/8	0	0.0
A	DCL INC	1- 1	5/8	-	-9.1
N	DPF INC	5- 8	7	+ 1/4	+3.7
N	ITEL	6- 15	13 3/8	+1 1/8	+9.1
N	LEASCO CORP	6- 19	17 1/2	+ 3/4	+4.4
O	LEASPAC CORP	0- 1	1/4	0	0.0
O	NRG INC	0- 1	1/2	+ 1/8	+33.3
A	PIONEER TEX CORP	6- 9	7 1/8	+ 3/8	+5.5
N	U.S. LEASING	7- 12	9 1/2	+ 1/2	+5.5

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
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SOFTWARE & EDP SERVICES

EXCH		1976 RANGE (1)	CLOSE SEP 8 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 3	1 3/4	- 1/4	-12.5
O	ANACOMP INC.	6- 11	6 1/8	-1 7/8	-23.4
A	APPLIED DATA RES.	2- 4	3 1/2	- 1/8	-3.4
N	AUTOMATIC DATA PROC	17- 35	31	0	0.0
O	COLEMAN AMERICAN COS	2- 6	2 5/8	+ 3/8	+16.6
O	COMPUTER DIMENSIONS	3- 7	5 1/4	0	0.0
O	COMP ELECTION SYSTMS	5- 9	6 1/4	+ 1/2	+8.6
O	COMPUTER HORIZONS	1- 2	1 1/2	- 1/4	-14.2
O	COMPUTER NETWORK	2- 6	3 5/8	0	0.0
N	COMPUTER SCIENCES	4- 8	6 1/4	0	0.0
O	COMPUTER TASK GROUP	1- 1	1	0	0.0
O	COMPUTER USAGE	3- 6	3	0	0.0
O	COMSHARE	2- 9	5 3/4	0	0.0
O	DATA DIMENSIONS INC	2- 4	2 3/4	0	0.0
O	DATATAB	1- 1	1 3/8	0	0.0
N	ELECTRONIC DATA SYS.	12- 19	15 5/8	- 7/8	-5.3
O	INFONATIONAL INC	1- 1	1/8	- 1/4	-66.6
O	INSYTE CORP	1- 3	1 3/4	- 1/8	-6.6
O	IPS COMPUTER MARKET.	1- 2	1 1/8	0	0.0
O	KEANE ASSOCIATES	2- 4	2 5/8	0	0.0
O	KEYDATA CORP	2- 5	1 7/8	- 1/8	-6.2
O	LOGICON	3- 4	3 1/2	0	0.0
A	MANAGEMENT DATA	1- 3	2	- 1/4	-11.1
A	NATIONAL CSS INC	13- 25	21 3/8	- 7/8	-3.9
A	ON LINE SYSTEMS INC	18- 22	20 1/4	+ 1/4	+1.2
N	PLANNING RESEARCH	3- 5	3 5/8	- 1/4	-6.4
O	PROGRAMMING & SYS	1- 1	3/8	0	0.0
O	RAPIDATA INC	2- 5	2 3/8	+ 1/8	+5.5
O	REYNOLDS & REYNOLD	13- 21	16	+ 1/4	+1.5
O	SCIENTIFIC COMPUTERS	1- 1	7/8	+ 1/8	+16.6
O	TYMSHARE INC	19- 28	26 1/8	+1 3/8	+5.5
A	UPS SYSTEMS	3- 5	3 3/8	0	0.0
N	WYLY CORP	2- 7	1 5/8	+ 1/8	+8.3

PERIPHERALS & SUBSYSTEMS

EXCH		1976 RANGE (1)	CLOSE SEP 8 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	8- 13	9	- 1/4	-2.7
O	ADVANCED MEMORY SYS	4- 10	6 7/8	+ 3/4	+12.2
N	AMPEX CORP	5- 10	7 1/4	- 1/8	-1.6
O	ANDERSON JACOBSON	2- 4	2 7/8	+ 1/8	+4.5
O	APPLIED DIG DATA SYS	13- 25	19 1/4	-2	-9.4
O	BEEHIVE MEDICAL ELEC	3- 9	8 5/8	+ 5/8	+7.8
A	BOLT,BERANEK & NEW	7- 11	8 1/2	+ 5/8	+7.9
N	BUNKER-RAMO	5- 10	7 7/8	+ 3/8	+5.0
A	CALCOMP	4- 7	4 7/8	0	0.0
O	CAMBRIDGE MEMORIES	0- 6	5/8	0	0.0
N	CENTRONICS DATA COMP	20- 36	31 5/8	+1	+3.2
O	CODEX CORP	22- 42	37	0	0.0
O	COGNITRONICS	1- 1	7/8	0	0.0
O	COMPUTER COMMUN.	1- 6	5 1/4	+ 1/8	+2.4
O	COMPUTER CONSOLES	4- 7	5 3/4	0	0.0
A	COMPUTER EQUIPMENT	1- 3	1 5/8	0	0.0
O	COMPUTER TRANSCEIVER	1- 3	7/8	0	0.0
O	COMTEN	4- 9	7 5/8	+ 5/8	+8.9
N	CONRAC CORP	20- 25	21 3/4	+ 1/8	+0.5
O	DATA ACCESS SYSTEMS	1- 4	3 3/4	0	0.0
O	DATA 100	7- 13	9	+ 1/8	+1.4
A	DATA PRODUCTS CORP	5- 15	13	0	0.0
O	DATA TECHNOLOGY	1- 2	1 5/8	- 1/8	-7.1
O	DATUM INC	1- 2	1 3/8	- 1/8	-8.3
O	DECISION DATA COMPUT	1- 4	1 5/8	+ 1/8	+8.3
O	DELTA DATA SYSTEMS	1- 1	1 1/4	0	0.0
N	ELECTRONIC M & M	1- 4	3 5/8	0	0.0
O	FABRI-TEK	1- 1	7/8	+ 1/8	+16.6
O	GENERAL COMPUTER SYS	1- 2	1	- 1/8	-11.1
N	HAZELTINE CORP	4- 12	8 7/8	+ 3/8	+4.4
N	HARRIS CORP	34- 55	54 3/8	+1 5/8	+3.0
A	INCOTERM CORP	9- 29	10 3/8	+1 1/8	+12.1
O	INFOREX INC	3- 7	4 1/4	+ 1/4	+6.2
O	INFORMATION INTL INC	10- 18	11 1/4	0	0.0
O	INTEL CORP	59-109	64 1/2	+2 1/2	+4.0
A	LUNDY ELECTRONICS	3- 7	3 1/4	- 1/4	-7.1
O	MSI DATA CORP	3- 7	6 1/4	0	0.0
A	MILGO ELECTRONICS	15- 21	16 3/4	+1	+6.3
N	MOHAWK DATA SCI	3- 10	7	- 3/8	-5.0
O	PENRIL CORP	1- 3	2	- 1/8	-5.8
A	PERTEC CORP	3- 8	7 3/8	0	0.0
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	5- 10	4	0	0.0
O	QUANTOR CORP	4- 6	4 1/8	- 1/8	-2.9
O	RECOGNITION EQUIP	6- 11	7 1/2	+ 1/4	+3.4
N	SANDERS ASSOCIATES	6- 11	8 3/4	+ 1/8	+1.4
O	SCAN DATA	2- 4	2	0	0.0
O	STORAGE TECHNOLOGY	9- 13	12	+ 5/8	+5.4
O	T BAR INC	5- 10	5 3/4	+ 1/8	+2.2
O	TALLY CORP.	4- 6	4 3/8	+ 3/8	+9.3
O	TEC INC	3- 6	6 1/4	+2 1/4	+56.2
N	TEKTRONIX INC	45- 67	59 3/4	+ 3/4	+1.2
N	TELEX	2- 5	3	0	0.0
O	WANGCO INC	11- 22	21 1/8	0	0.0
O	WILTEK INC	2- 2	2	- 1/4	-11.1

SUPPLIES & ACCESSORIES

EXCH		1976 RANGE (1)	CLOSE SEP 8 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED SYSTEMS INC	1- 4	3 1/4	0	0.0
O	BALTIMORE BUS FORMS	3- 5	2 3/4	0	0.0
A	BARRY WRIGHT	6- 10	7 3/4	+ 1/4	+3.3
O	CYBERMATICS INC	1- 1	1/2	0	0.0
A	DATA DOCUMENTS	25- 42	28 3/4	+1 1/2	+5.5
O	DUPLEX PRODUCTS INC	13- 24	13 3/8	- 1/8	-0.9
N	ENNIS BUS. FORMS	6- 8	6 3/8	+ 1/8	+2.0
O	GRAHAM MAGNETICS	8- 13	9 1/2	0	0.0
O	GRAPHIC CONTROLS	13- 19	15	- 1/4	-1.6
N	3M COMPANY	53- 65	63 3/4	+1 1/8	+1.7
O	MOORE CORP LTD	38- 51	38 1/4	- 1/4	-0.6
N	NASHUA CORP	11- 19	16 1/2	- 1/8	-0.7
O	STANDARD REGISTER	15- 19	15 1/2	0	0.0
O	TAB PRODUCTS CO	5- 11	9	- 1/4	-2.7
N	UARCO	20- 25	20	- 1/4	-1.2
A	WABASH MAGNETICS	4- 8	7 5/8	+ 3/8	+5.1
N	WALLACE BUS FORMS	19- 25	20 1/4	0	0.0

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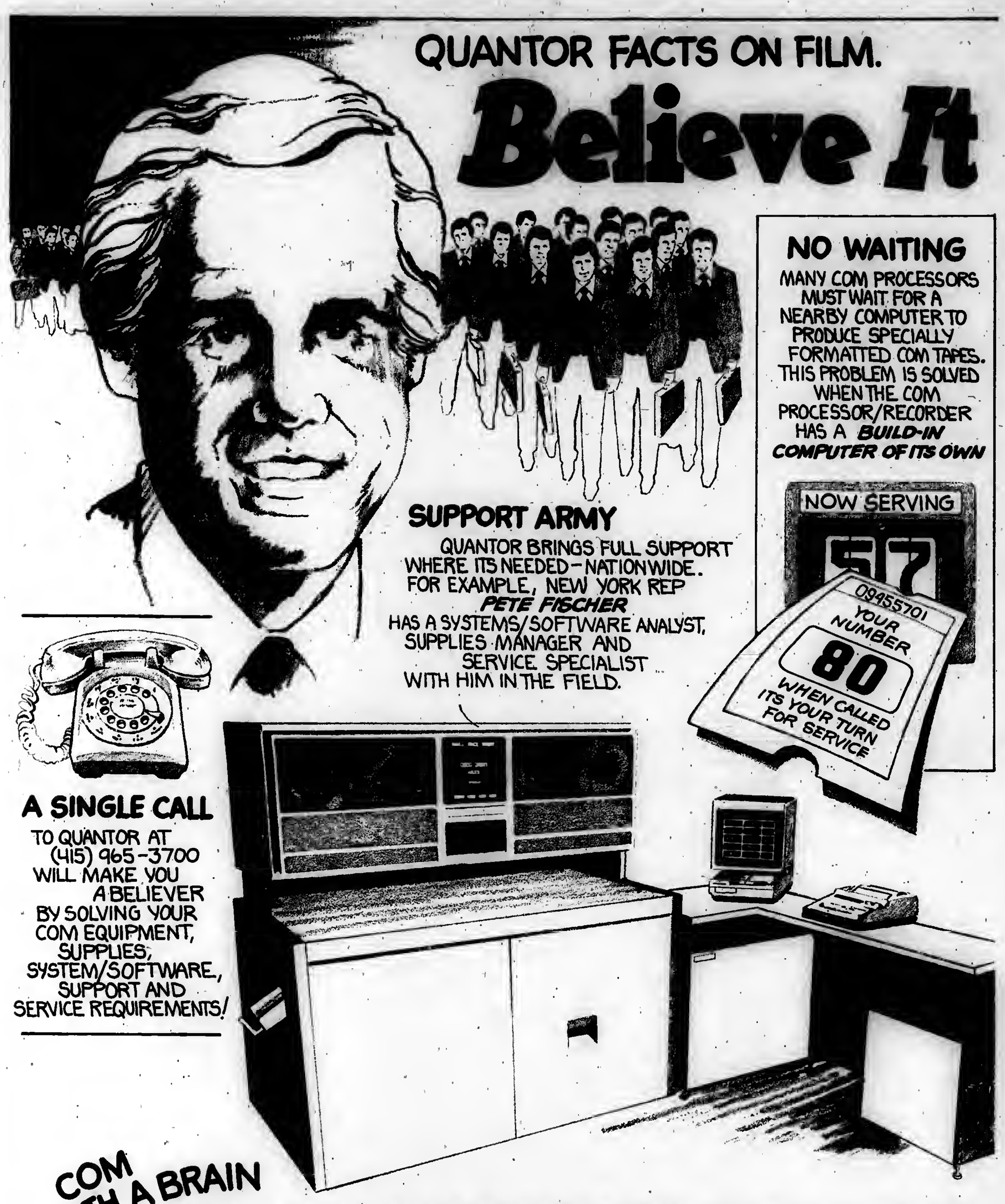

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NEWSPAPER

Bell Lags Independents in Modems

The Consumer Communications Reform Act of 1976, now pending before Congress, seeks to effectively eliminate competition within the telephone industry. One premise of the proposed legislation is that competition in communications has been detrimental.

This article is the first of two which examine the area of data communications equipment and the major product contributions made by independent competitors.

By Ronald A. Frank
Of the CW Staff

Most of the major innovations in data communications modems and associated equipment have been pioneered by independent non-carrier vendors. Many of these innovations were later duplicated to some degree by the Bell System and its operating companies, although some features still are excluded by Bell, apparently for marketing reasons.

These findings are based on an examination of the dates associated with major data communications equipment innovations garnered from *Computerworld* files and verified by industry sources.

The major innovations have occurred in the high-speed data transmission areas which include 4,800- and 9,600 bit/sec. Many of the early suppliers of modems developed their original equipment for military applications and then began to tailor these data sets for commercial use.

In 1967, the Data Communications Division of Milgo (later called International Communications Corp. [ICC]) introduced a 4,800 bit/sec modem which included a manual equalization capability. This unit was believed to be the first to incorporate an equalizer as part of the modem; it is regarded as the device which initiated the high-speed private-line modem market.

Three years later, American Data Systems introduced a 4,800 bit/sec modem with automatic equalization and Datamax announced a similar

(Continued on Page 4)

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DP Seen Helping In Energy Crisis

By Toni Wiseman
Of the CW Staff

LOS ANGELES – The technological resources of the electronics industry can provide crucial help for America's energy crisis as it has in the past for the "missile gap" and the "space race," according to the president of TRW, Inc.

CW At Wescon

In his keynote address at the Western Electronic Show and Convention (Wescon) here last week, Dr. Ruben F. Mettler discussed the issues and opportunities relating energy and electronics.

The electronics industry is currently manufacturing low-cost synthetic intelligence, for example, which is finding extensive and increasing application wherever energy is consumed, Mettler said.

"Today's LSI circuits and microprocessors are really a form of synthetic, mass-produced intelligence," he said. "Right now, American electronics companies are

(Continued on Page 7)

Numerous Outages in FAA System Putting Aircraft in Danger?

By Ann Dooley
Of the CW Staff

INDIANAPOLIS – Air controllers at the Indianapolis Air Traffic Control Center here have charged they were out of touch with aircraft in flight at least 126 times in a recent 40-day period because the Federal Aviation Administration's (FAA) computerized air traffic system failed.

"We have no idea why the system is gone or when it's going to come back. When you're playing with planes at 500 or 600 miles an hour, it can be dangerous," Dave Morton, an air traffic controller, said.

Since 1974, when the radar data processing (RDP), or narrow-band radar, was implemented at the 20 air-route traffic centers which comprise the nation's air tracking control operation, momentary interrupts or outages have occurred, leaving the system virtually nonfunctioning.

At those moments, controllers have no radar contact with aircraft and must immediately decide whether to wait for the system to come back up or to switch to the noncomputerized and less informational backup system. Such a decision could be critical depending on the number and proximity of planes in an area.

While the time to switch to the backup method is short, controllers have complained it is difficult for them to adjust back and forth to the different systems.

After originally denying reports of the number of failures, FAA officials admitted to Rep. David Evans (D-Ind.) that the Indianapolis center had 97 outages of less than a minute and 29 blanks of more than a minute from June 1 to July 10 and said the reported failures in the system constitute "real and valid cause for high-level concern."

Controllers said they believe the number of outages to be closer to 20 to 30 a week, however.

The outages can occur for a number of reasons, some of which can be inefficient programming or insufficient software; the controllers have complained they are the ones left to correct the mistakes.

"You get so used to the presentation of the data, you get too dependent on the

(Continued on Page 4)

Programmers: 'Wrong on Tasks'

By Don Leavitt
Of the CW Staff

LONDON – Programming is still "the unwanted and unrecognized profession without sound foundations," according to Alex d'Agapeyeff, who told a plenary session of the 1976 European Computing Congress (Eurocomp) here last week that "most of the time we have been doing the

CW At Eurocomp

wrong task on the wrong equipment in the wrong way."

Later, the chairman of Computer Analysts and Programmers, a UK software house, and ex-president of the British Computer Society added however that the situation can change only it programmers turn away from the ways they have been working and start to design, build and use flexible, reusable libraries of logical components.

Prof. Brian Randell of the University of Newcastle agreed in general, but noted that while d'Agapeyeff was describing a new form of "bricks and mortar" to build systems, "the fact is that we don't even know what bricks we should be using."

Another panelist, Phil Kiviat, technical director of the U.S. Federal Computer Performance Evaluation and Simulation Center (Fedsim) argued that programming isn't really the principal problem in DP today.

There is, Kiviat said, the far more fundamental question of what is suitable for computerization. Programming "is only a tactical concern," he commented.

During his talk, d'Agapeyeff pointed to four reasons for what he believes is the poor state of affairs in programming. First, he said, programming isn't really professional; there is no widely accepted definition of the skills or training required, and there is no real building on prior experience.

Traditional professions work from precedents – "or, put another way, they stand on the shoulders of those who went before" while "we stand on their toes."

Beyond that, "we listen to quack

(Continued on Page 2)

Users Seem Willing to 'Digest' IBM Price Hikes

By Molly Upton
Of the CW Staff

While the Computer Lessors Association (CLA) intends to formulate a plan to protest IBM's latest price hike on maintenance as a "discriminatory action," users seem to be willing to "digest it as well as possible."

The price hikes, which become effective on Nov. 16, apply to purchased 360s, the lower end 370s through the 125s and assorted peripherals, but not to similar gear under IBM's Monthly Availability Charge (MAC) plan [CW, Aug. 23].

The CLA will discuss courses of action during its annual meeting on Oct. 12 in Montreal, according to James Benton, its executive director.

The association will probably talk with the Justice Department and "might have to take matters into our own hands. We can't live with these kinds of increases," Benton said.

"I really think the whole purchase DP community should rebel," he added.

Thomas McArdle, president of both the CLA and National Computer Rental Ltd., said "I think there's no question that it's an attack on the leasing industry."

He sees IBM as "basically using maintenance as a ploy over a period of time to force obsolescence of equipment because of very high maintenance costs.

"It seems it's discriminating against machines that have been around for a while," he said, adding "this is about the fourth increase in four years, averaging 15% each time."

For instance, maintenance charges for a 1403 printer in 1972 were $177/mo compared with $270/mo currently. If increases continue at the same rate, the 1980 fee will be $470/mo, he observed.

In the past, IBM has increased its rental prices as well to reflect the maintenance hikes, but this time the increase was applied to purchased machines only, he said.

"If IBM increased MAC a proportionate amount . . . then it hangs together, but there's no way it hangs together now," Benton added.

Most lessors' equipment has been serviced by IBM since it was purchased and has received identical service to that owned by IBM, so they had difficulty coming up with a rationale other than the move is "discriminatory."

When asked why IBM raised the maintenance charges for purchased gear and not for similar equipment under MAC, a spokesman said "the direct cost of maintenance is only one of many factors which must be considered in arriving at a

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CLA to Protest 'Discriminatory' IBM Price Hikes, But Users Express Willingness to 'Digest' Them

(Continued from Page 1)

lease or rental price."

Benton pointed out a similar price increase has not been announced in Canada, attributing this to Canada's anti-inflationary board that reviews companies' justifications for price increases.

Although most lessors are passing the increases on to the users, they are upset because the price hikes diminish the savings the users realize by obtaining their equipment from third-party leasing firms.

Also, "the higher the maintenance goes, the more difficult it becomes to remarket that equipment," McArdle noted.

An IBM spokesman, however, said IBM Canada had not asked the board for an increase.

Reactions of users contacted by *Computerworld* ranged from those who were upset and looking at alternatives to those who were philosophically accepting the increase. Some spoke highly of IBM maintenance and felt it was worth the increased price.

Wayne McCollum, DP manager for Riceland Foods in Stuttgart, Ariz., has a 360/30, 360/50 and IBM peripherals.

Riceland, which is "52 miles in the country from nothing," will probably stay with IBM simply because it receives "super service. We demand it and we pay for it," he said.

The firm serves 27 food cooperatives and operates a 310K real-time system on which it is very dependent, he said.

"I don't think we can back off from our maintenance responsibilities," he added.

Harvey Albert, DP manager for Genuine Parts Co.'s Eastern Division, said he's "not too happy." The move will increase his maintenance bills by about $200/mo or 15%.

"I was under the impression there would be reduction on some items, but I haven't found any," he remarked.

Genuine is exploring independent maintenance, he said. "Overall, the general feeling is we're very, very unhappy" with the price hike.

The auto parts distributor uses IBM maintenance for its third-party 360/40 and everything except add-on memory from Computer Investors Group and its disk drives, which are maintained by Sorbus, Inc.

The increase "is just like everything else, it's another overhead that has to be passed on to the customer," Albert said.

Genuine has seven other similar locations, so the price rise means an increased bill of $1,600/mo for the entire firm," he said.

Somewhat Nonplussed

But Ray Allen, vice-president of Blue Chip Stamps in Commerce, Calif., was somewhat nonplussed by the hike.

Maintenance rates have gone up not only on IBM equipment, but on other gear as well, "so I guess I'm not too upset about it," he said. They all seem to be rising by the same percentages, Allen added.

He rejected obtaining other maintenance for his third-party 360/30 with IBM disk and tape: "Even though people complain about IBM service, it's probably still the best in the business.

When you have a mixed selection like we do, you can tell who's good and who isn't," he added.

Another fan of IBM service is Robert Doherty, American Credit Corp.'s computer operations supervisor. He "doesn't particularly like the increases," but there's "nothing you can do about it."

The increases will mean a hike of about 15% in the maintenance bill for its all-IBM shop, which includes a 360/50 with 512K and three banks of 2314 disks.

Despite the cost, however, the firm isn't looking to independents. "We're well satisfied with the maintenance agreements and the results we get from IBM and our equipment. We'll try to digest it as much as we can," Doherty said.

Ernest Loyer, director of lingerie manufacturer Stardust, Inc., was ecstatic his leased 360/30 is not affected since it is serviced by Sorbus under a long-term contract with a set price.

Programmers Hit for Doing 'Wrong Tasks With Wrong Tools'

(Continued from Page 1)

authorities," he said before describing a study group on which he briefly served whose task was to select a real-time language for government use.

None of the others in the group had any experience in programming, no evidence from technicians was solicited or accepted "and even my questions were disregarded so they chose Coral 66 [a 10-year-old language] as the official language."

In a more serious vein, but without dwelling on the subject, d'Agapeyeff noted the lack of computer expertise in the Data Protection Committee recently named by England's Home Secretary [CW, Aug. 9].

The attitude of the lay computer user – who sees the programmer as an unwanted middleman – is the third reason for the scorn often heaped on programmers, according to d'Agapeyeff. These users often see programs as meeting the programmer's needs and not really those of the user at all, except almost incidentally.

"We must catch the imagination of the users so they can grasp what it's all about," he said before adding, "We don't know much about programming ourselves."

Even the well-publicized conference sponsored by the North Atlantic Treaty Organization (Nato) in 1968 hasn't had much impact, d'Agapeyeff said. While the idea of software engineering, first given a name there, has "some merit," programmers "have generally failed to grasp the true significance of data base," another subject of that same conference.

The fourth reason for programming's present situation is that the current approach to application specifications "is all wrong," he went on, noting the demand for "fixed and unreadable" definitions is often impossible for the user to provide with any real sense of what benefits he may gain from them.

Instead, he suggested, "we should work from some sort of fundamental assumptions" that would provide outside limits for what could be done, inside of which the user could change his mind without penalty or embarrassment.

That sort of approach, however, can only become reality with the use of binding techniques simpler than the present compilers and with adequate libraries of precisely defined logic functions, he said.

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Also Links 3/15 Users With 3600

IBM Adds Eight Faster Printing Models of System 32

By Esther Surden
Of the CW Staff

ATLANTA – The introduction of eight faster printing models of the System 32 highlighted a passel of enhancements for General Systems Division products announced by IBM last week.

IBM also introduced magnetic ink character recognition (Micr) capability for the System 32, Industry Application Packages (IAP) for distributors, lumber dealers and the food industry and an attachment to link the 3600 Finance Communications System to the IBM 3/15.

The addition of faster printers to existing amounts of disk storage comprises the eight models of the System 32 announced. Four of the models are configured with a 285 line/min printer which IBM said doubles the 32's previous line printing capacity; a bidirectional 120 char./sec printer on the remaining models is 40 char./sec faster than the character printer on previous 32 models, the company said.

The firm increased the system's printing capacity to cope with the printing requirements of certain popular applications which "exceeded our offerings at the present time," an IBM spokesman explained.

Present System 32 users can upgrade their units with the printers, he added. For example, a user with a System 32 Model A-24 with an 80 char./sec printer and 13.7M bytes of disk could upgrade to the 120 char./sec printer and the same amount of disk for $1,200.

A Model B-34 user with 13.7M bytes of disk and 155 line/min printer could upgrade to the 285 line/min printer for $8,950, he said.

The eight System 32 models, which will be available next May, range in price from $34,230 for 3.2M bytes of disk and a 120 char./sec printer to $50,410 for a 285 line/min printer and 13.7M bytes of disk.

Micr Capability

The Model 1255 magnetic character reader now operates with the System 32, IBM said. The reader, formerly available only for the 3, 360 and 370 systems, allows small banks and branches to read and sort Micr-encoded documents at speeds of 500- to 750 document/min depending on which model is chosen, the company said.

The 1255 attachment to the 32, available next May, costs $8,775 or $245/mo; the reader itself costs $35,460 or $904/mo for a six-stacker model and $55,260 or $1,450/mo for a 12-stacker model.

The attachment linking the 3/15 to the 3600 Finance Communication System gives 3/15 banking users a capability previously available only to 360/370 users, the spokesman noted.

The family of on-line terminal devices for banks and thrift institutions includes a controller, passbook printers and automatic teller machines.

The 3600 attachment will be available in the second quarter of 1977; no charge will be made for the attachment itself, IBM said.

The IAPs for distributor management, lumber dealers and food distributors consist of four modules each. The programs were designed to help users perform billing, inventory control, accounts receivable and sales analysis.

The IAPs can operate with the recently announced financial applications programs for distributors that consist of accounts payable, general ledger and payroll programs, IBM said.

The distributor IAPs will be available next month and the food and lumber programs will be available in December. The billing module costs $715 initially and $32/mo thereafter as a license fee; the inventory control module costs $625 and $28/mo; the accounts receivable module has an initial charge of $495 with a monthly fee of $22; and the sales analysis program costs $625 and $28/mo.

DP/Graphics System Needed for Business

By a CW Staff Writer

LOS ANGELES – Combining alphanumeric and graphic information will permit businessmen to intelligently deal with the ever-increasing data flow which is the necessary part of the decision-making process, according to Dr. Erik Albarda of Arthur D. Little, Inc.

The development of a business graphics system that enables visualization of data for use by the business community is the challenge which faces the industry today, he told a session at last week's Western Electronic Show and Convention (Wescon) here.

While more than 70,000 output devices are used by DP installations worldwide, only 5% are capable of displaying information graphically, Albarda noted.

"Most of these devices are designed for highly specialized applications. Few, if any, are designed primarily for business applications," he said.

Currently there is no available system, hardware or software, that meets the needs of the business community, he stated.

Visualization of data bases and processed results poses an attractive alternative to the commonly produced long lists of printouts with numbers, he asserted.

Albarda outlined nine features a business graphics system should include: ease of operation, compactness, immediacy, patterns and trends, comprehensiveness, zooming, ratio analysis and socio-economic indicators.

Such a system should be as easy to operate as a copier, he said, adding there are elements of business graphics systems available in today's technology, but they are programmers' tools.

Albarda suggested an effective feature of a business graphics system would be the ability to display large amounts of data in the form of a thematic data map which would permit retention of both an attention-focusing capability or a structural-relational capability.

The LIBRARIAN® and MetaCOBOL® from ADR Boost Efficiency at Computer Power, Inc.

Computer Power, Inc., Jacksonville, Florida, provides complete data processing services for a number of banks, mortgage bankers and saving and loans whose mortgage portfolios have over 1,250,000 mortgage loans valued at over 24 billion dollars.

Over 8,400 program modules are now used to provide client services—modules which require storage space equivalent to 2.7 million card images.

Until The LIBRARIAN was installed, program storage and management was an expensive and time consuming problem

According to Technical Support Manager Roy Filager, "Before we installed The LIBRARIAN, we stored everything on 17 IBM model 2314 disk packs. That meant we had 17 different source statement libraries. We were making 1000 pack changes a month and we were spending over 50 hours of computer time each month reorganizing files."

"Program standardization was a problem too. Programmers would make changes to one pack and not duplicate the changes on the other packs."

The LIBRARIAN enabled Computer Power, Inc., to cut disk storage by 94%.

After The LIBRARIAN was installed 2 years ago the entire source statement library was immediately compressed with the result that Computer Power, Inc., using the IBM 3330 disk system, now stores all of its 8400 program modules on a single disk, constantly on-line. The benefits were far greater than just the savings in disk use, however. Time required for file reallocation was virtually eliminated. Elimination of disk shutdowns and disk changes added another 50 hours a month of usable computer time. And standardization rapidly improved because common program changes no longer had to be duplicated on many different disks.

"We really have file backup now. And that's tremendous."

Roy Filager remembers, "When we had 17 packs our backup and savings procedures were extremely time consuming. Now, with The LIBRARIAN and only one disk pack, we are able to save everything every single day in just 20 minutes."

ADR's MetaCOBOL is doing more than just conversion.

Computer Power, Inc., is in the final phases of conversion of more than 6000 program modules from DOS to OS/ANS. According to Roy Filager, "We're running through MetaCOBOL and coming out with state-of-the-art programs, OS/ANS, single entry, single exit with I/O completely changed. All the programs we have converted so far have executed perfectly the first time."

Programs are being standardized as they go through MetaCOBOL.

"Everything coming out is looking alike. MetaCOBOL is picking up errors in violation of COBOL specifications that the compilers would let go through. As a result, our programs are really coming out clean," he continued.

"As far as I know, there is no alternative to MetaCOBOL."

"Any other system would have required hand-made changes involving a staggering amount of time," Roy Filager added.

ADR software products are an integral part of over 5,000 installations worldwide. Each ADR product is not just a program, but a complete package with full documentation and on-site support. ADR is the only software company with 50 branch offices and representatives in 28 countries—each staffed with ADR-trained technicians.

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Bell System History Shows Lag in Modem Innovations

(Continued from Page 1)

device with forward error correction. Both features simplified data transmission for users, but were not offered by the telephone company.

During this period the Bell System had a multipurpose modem known as the 203 data set which transmitted at speeds up to 7,200 bit/sec. Its transmission scheme, however, was considered less reliable than those of the independent suppliers and automatic equalization was not available on this unit until 1971.

It was not until 1972, or five years after the first independent modem, that Bell delivered its 208A data set, which was considered a direct competitor for the earlier independent modems.

In 1970 Codex Corp. had a 4,800 bit/sec modem that was the first to include a built-in multiplexer, thc first to have customer-operated diagnostics to check line quality and the first to have a setup time less than 1 sec.

The setup time was important because computer front ends (mainly the 270X from IBM) timed out in 3.5 sec. If the modem did not get below this higher number, the entire computer connection would be terminated and it would have to be manually reestablished by an operator.

While all early independent modems offered multiplexing, Bell did not provide this capability before 1974, when the 209 data set was first delivered. This was four years after the first independent modem with a built-in multiplexer was installed. When a user is able to multiplex data transmission streams, there is usually a savings in line and/or equipment costs.

First 9,600 Unit

In 1967, Codex Corp. installed a 9,600 bit/sec private-line modem with automatic adaptive equalization and 3.5 sec setup time. This unit was the first to let users transmit data at this higher speed.

Originally priced at $23,500, this modem was within the reach of only the larger sophisticated users such as airlines, who were operating computerized reservation systems.

Bell did not have a 9,600 bit/sec data set until 1974 – seven years after the Codex modem – when it announced the 209.

In 1971, Codex introduced a series of modems operating at 4,800-, 7,200- and 9,600 bit/sec. These devices were the first to offer dial backup capability in the event a private line failed.

Bell did not offer dial backup, and its users were required to have a second set of modems if they wanted to duplicate these features. The price of the Codex 9,600 bit/sec modem was $11,500, less than half the cost of the original Codex modem.

Industry experts generally regard ICC as having set the pace in 4,800 bit/sec modems while Codex pioneered in the 9,600 bit/sec area. The transmission schemes of each independent supplier were adopted by international organizations as certified standards and the Bell 208 and 209 were patterned after each company's methods.

Dial-Up Modems

After developing higher speed modems on private lines, independent suppliers applied the same devices to dial-up facilities. Although private lines could be conditioned to make them more suited for data transmission, this was not possible on a dial-up connection because the circuit path was randomly established with each call.. In 1974, Intertel, Inc. introduced a 9,600 bit/sec modem that operates without conditioning on private lines.

Despite these limitations, dial-up modems became commonplace at both 4,800- and 9,600 bit/sec. Bell has a dial-up version of its 208 data set for 4,800 bit/sec users, but there is no dial-up unit for operation at 9,600 bit/sec. Several Independent suppliers have such modems, however.

In many cases independent suppliers have tended to combine multiple features in transmission devices. In particular, operator-initiated test and diagnostics allow the user to test both the modem and the line operation. Most features such as these originated with independent suppliers and were later duplicated to a lesser extent by the Bell System.

Advanced circuit technologies such as MOS and LSI were Introduced by the independent suppliers and later offered by the telephone companies. These improvements tended to reduce the costs of modems and were met by lowered prices for Bell data sets.

Many of the companies that provided modems and pioneered innovations are no longer in business. One consultant has attributed this to the fact that small independent firms cannot compete against AT&T and its ability to drop prices.

It is estimated that there are about 40 firms which supply modems of all types in competition with the telephone companies. Of these, most have a modem product line as part of a much broader range of equipment.

Only about 15 of these independent vendors concentrate on modems as their primary product, and each typically specializes in one segment of the total modem market.

Despite the relatively few firms matched against the significant resources and competition of the Bell System, the indcpendent vendors have set the standards for data communications equipment with the telephone companies reacting later.

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FAA Admits 126 RDP Outages

(Continued from Page 1)

machinery and then it's taken away from you so quickly and with no warning. It's good to modernize, but we just can't depend on this system anymore," Morton said.

Many controllers feel the system has actually increased their workload from a purely mechanical standpoint. Before the RDP system became operational, two people watched plane routes on a screen; now there is only one person to do the same job, because the second person is working on the computer, and that creates more strain on that one person, the controllers claimed.

While the entire national network has had outage problems, one of the most potentially dangerous situations occurred here at the Indianapolis center last June when lightning struck the system and the entire power supply went out.

In that instance, even the backup system was unable to work and controllers could only make contact with aircraft by radio.

Controllers had to manually hand off aircraft to other centers during the blackout, which lasted for 45 minutes, according to William Hirchert, deputy chief of the Indianapolis Air Traffic Control Center.

"It's the nature of our business; there is no waiting, you just have to take action and the controllers did an excellent job," he said.

In response to the failure, Evans began an investigation and he and FAA officials will review the center next month to ensure corrective changes have been implemented.

Critics of the RDP system have charged there has never been sufficient testing [CW, May 7, 1975]. They believe the system was put into use before the FAA knew enough about the problems that would occur in such a large and complex system.

The FAA claimed that adequate testing did occur and that the system was certified before it became operational. The Airways Facility, the group which certified the system, is part of the FAA, however.

Since the ultimate decision making is up to the controllers, Morton feels they should have more training with the computer itself.

"We were supposed to get 34 class hours and six hands-on hours and I ended up with 18 class and one and a quarter hours of hands-on training," he said. "And after that we're supposed to sit down in front of a monstrosity that has 128 buttons and can do probably 500 different functions and make these emergency decisions."

While the FAA said the system is continually being refined, controllers are unhappy that the outages continue to occur.

The narrow-band system follows the location of an aircraft along its course and also indicates the aircraft's identification, altitude and speed.

The RDP system consists of the central computer complex, composed of an IBM 9020 system, and channel display systems developed by Raytheon Corp.

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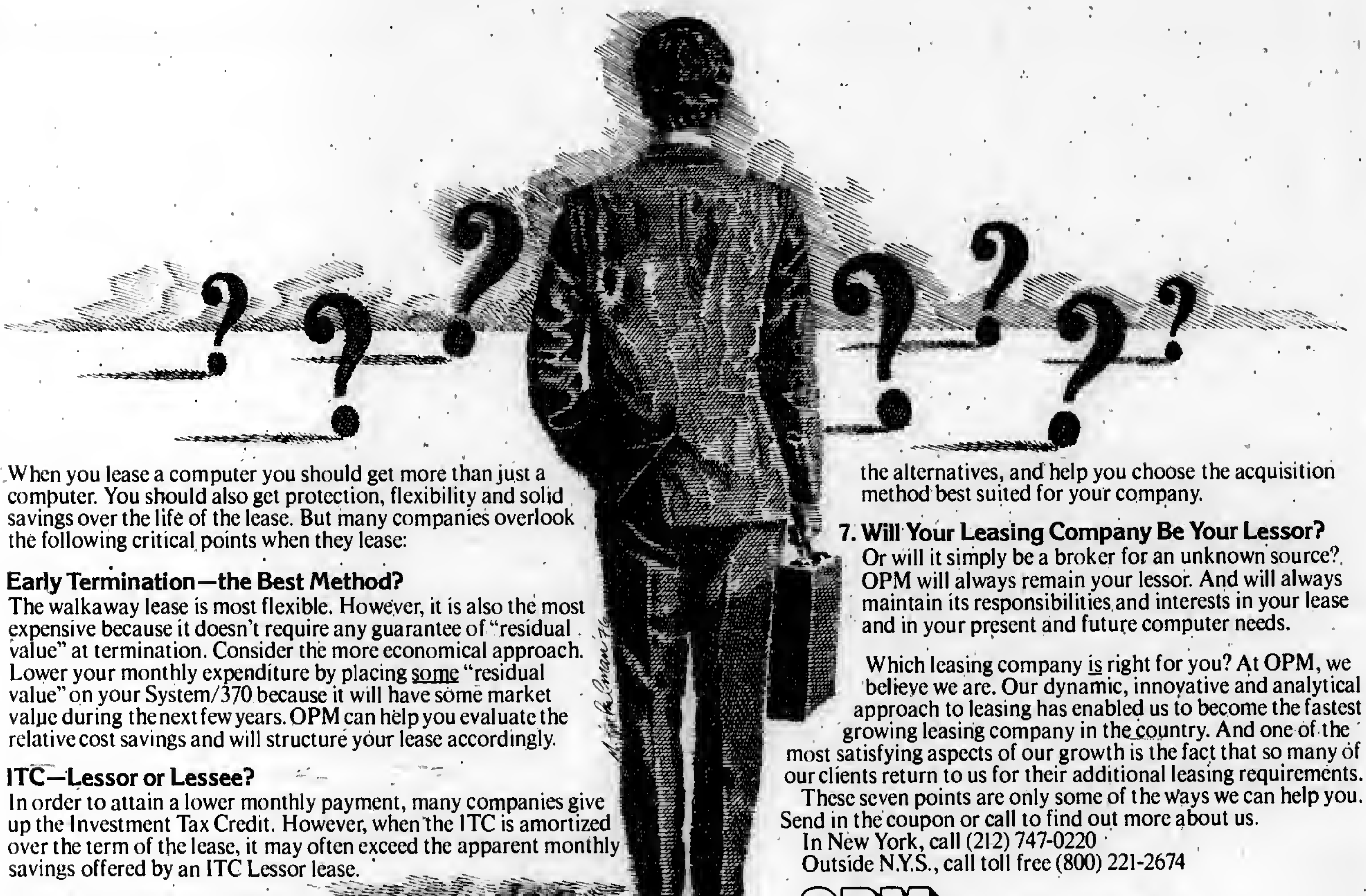
S/370 Computer Leasing: 7 Ways to Avoid Costly Mistakes



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CW 2

Attendees at Wescon Told

Industry Can Provide Important Help in Energy Crisis

(Continued from Page 1)

turning out synthetic intelligence at an astonishing rate.

"Electronic devices are bringing added intelligence, and hence efficiency, to the combustion process in the engines of automobiles," he added.

"They help monitor and control equipment at the refineries which produce oil and even make the oil exploration process more effective by analyzing data from oil wells.

"Increasingly, electronics intelligence is helping people make the use of energy in industrial plants more effective, and in the future it will probably do so in individual homes as well," Mettler said.

Structured to Help

The electronics industry is well structured to help America with the energy crisis, Mettler reasserted. It is large, with $50 billion in sales expected this year; it is a fountain of advanced technology; and it has a record of being able to reduce prices to expand the application of its products, such as semiconductor devices, he said.

Investments in electronics are relatively small and development times relatively short compared to those for processes such as coal gasification and liquification, he said, adding that as energy prices rise, economically justifiable electronic applications related to energy will increase in size, offering the industry new markets for its products and services.

Market in Automotives

Automotive electronics will be a growing market, he noted, estimating that market will grow at a 40% annual rate and reach approximately $1 billion by 1985.

General Motors, for example, has announced it will use a microprocessor in its electronic spark-timing system; Chrysler plans to use a pair of microprocessors to accomplish efficient combustion of lean air-to-fuel mixtures, he said.

"This lean-burn system requires seven inputs of data on engine conditions, and the data is used by computers to determine the exact instant at which individual spark plugs should be fired," Mettler explained.

In addition to bringing electronic intelligence to the combustion process, the industry can also replace unnecessary or wasteful transportation with electronic communications systems, Mettler said.

Wescon coverage continues on Pages 35, 38 and 41.

Today, thanks to telecommunications systems, an increasing amount of information travels electronically, he said, noting that scientists no longer have to travel to computers as computers are being linked to one another and to people.

In the energy field itself, electronics are also making inroads, he said. In Texas, there is a computer-to-computer network which processes raw logging data from oil wells.

$5 Billion From Oil Industry

Minicomputers in the field process data from nearby wells, then transmit the processed data to a mainframe which interprets it and sends the results back to the field computers. These then print out reports for the explorers, he explained.

"This year the petroleum industry will spend close to $5 billion on the automation of oil production; a healthy portion of this will go toward electronic and electro-mechanical controls," Mettler said.

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209A	SLD	4,316	5,676/yr	10
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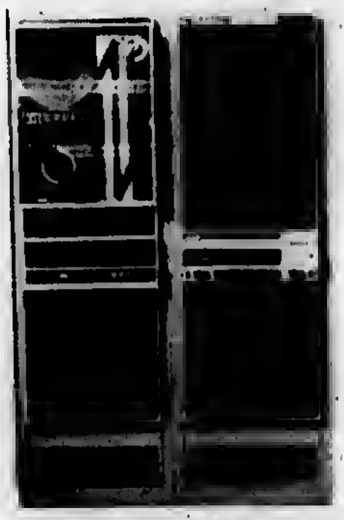

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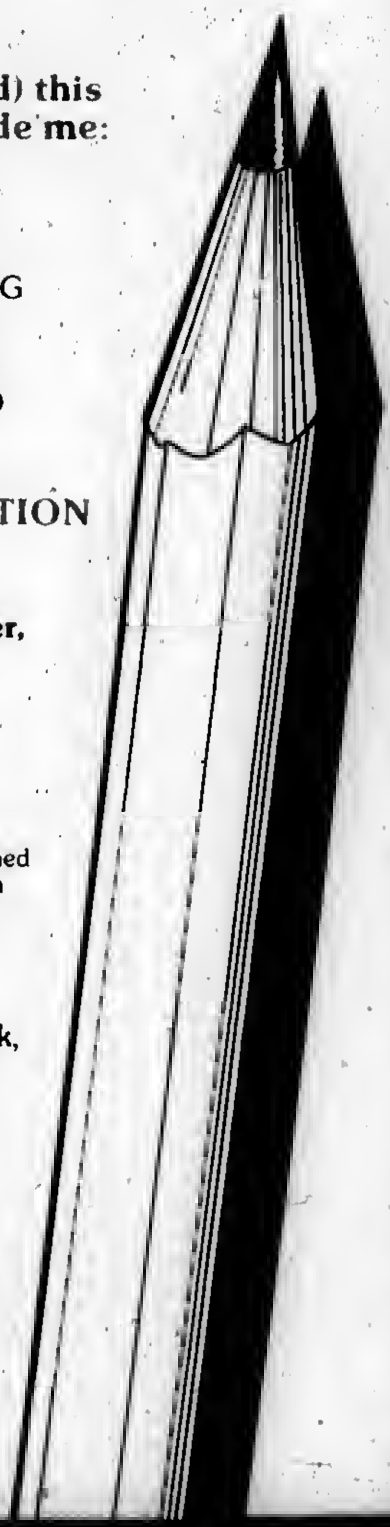

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Price, Features Other Factors

Simplicity Seen Key to Bringing DP 'To the Millions'

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. – "Computers . . . By the Millions, For the Millions" was the theme of Compcon '76, the 13th IEEE Computer Society International Conference held here recently, and of its keynote speaker, Robert W. Galvin, chairman of the board and chief executive officer of Motorola Semiconductor Products, Inc.

While the industry undoubtedly expects to provide DP devices "by the millions" to "the millions," the public, in the years ahead, it must do so by permitting users a direct interface with the logic of computer design and use, Galvin said.

Giving users this opportunity depends on the development of systems that have a "greater simplicity," are within the range of household pocketbooks and offer the best combination of features the public will want, he added.

Although Galvin couldn't predict how the industry will unlock the technical problems involved – particularly those of simplicity, he unreservedly affirmed the notion that making generally available computer devices is "the overall dream of the industry."

In addition, he suggested making such equipment affordable could be the most challenging aspect of the entire effort for the industry.

The most appealing aspect of the computer from the consumer viewpoint won't be its computational ability, but the facility it offers as an aid to help direct thinking, the keynote speaker predicted. He envisions families using the devices to provide logical checklists of things to think about when making decisions important to a household.

'20 Questions'

Users would play "a very fancy '20 Questions' game" with these "thinking devices," Galvin stated, stressing this kind of computer would not provide answers but would help consumers clarify the issues confronting them in such debates as whether to buy a home or a condominium or to rent an apartment.

If the public is to use computers in everyday life, however, consumers need to be taught to "systems think." Industry is responsible for actively encouraging this kind of education, he said.

Referring generally to experiments with fourth- and fifth-grade students which found average students are "easily grasping the principles of feedback and liking them," Galvin urged his audience to "embrace the advocacy of systems training for young children now so they will be competent to deal with systems tools in the future."

Once "systems for the millions" are developed, the industry will have to work on improving communications. "We will need a broader band of communications . . . a project which zeros in on the concept of the wired city," he suggested.

Cable television and the entire spectrum of which TV is a part provide promising means of broadening the communications band, Galvin added, noting there will be technical and affordability problems with this industry dream as well.

If these problems can be overcome, however, users could conceivably employ unused TV channels to access the information today held within several volumes of the *Encyclopedia Britannica*, an observer hearing Galvin's address commented. TV sets would serve as display devices.

CW
At Compcon

Amdahl Gets Award For DP Contributions

WASHINGTON, D.C. – Some 800 people turned out to attend Compcon '76, the 13th IEEE Computer Society International Conference, and to see the society present its most prestigious award to Dr. Gene M. Amdahl here recently.

Amdahl, who heads the corporation bearing his name and who was instrumental in the development of the Amdahl 470V/6, won the W. Wallace McDowell award.

Established through a grant by IBM to honor McDowell, its retired vice-president, the certificate and $1,000 cash prize were given to Amdahl "for his contributions to the architecture and design of computer systems and for his achievement in promoting advancements in the computer state of the art through business enterprise."

In addition to the 470V/6, Amdahl's computer system credits include major contributions to the IBM 704, IBM's "supercomputer" known as Stretch and its System 360.

Amdahl also helped develop the preliminary design for Ramo-Wooldridge Corp.'s RW300 and headed the group that proposed and designed the ARDC, a logical evaluator for file searches, for Ford Motor Co.'s Aeronautics Division.

The prize was accepted for Amdahl by his brother, Lowell D. Amdahl.

Proceedings of NCC '76 Now Available From Afips

MONTVALE, N.J. – The *Proceedings of the 1976 National Computer Conference* (NCC) is now available from the American Federation of Information Processing Societies, Inc. (Afips), the conference sponsor.

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U.S. Energy Data Collection Efforts Found Redundant

By Catherine Arnst
Of the CW Staff

WASHINGTON, D.C. – Two reports issued here indicate "new energy data collection efforts have been piled on top of old" by federal energy agencies, resulting in a plethora of information and information processing systems that cover the same ground.

A study released recently by the General Accounting Office (GAO) on federal energy data collection stated little has been done to remedy efforts in this area since a similar report analyzing the situation was made two years ago.

An investigation of the problem by the House Appropriations Committee, whose findings have not been officially released yet, reached a similar conclusion: The government's energy agencies are gathering "an enormous amount of data which has got to be duplicative" and "very expensive," according to Rep. Sidney Yates, a member of the committee.

Yates read part of the committee's report during hearings held last March. Investigators talked to the Office of Management and Budget (OMB), Bureau of Mines, Geological Survey (GS), Federal Power Commission, the Bureau of the Census, the Energy Research and Development Agency and the Federal Energy Administration (FEA).

They found that "as of January 1976, the six agencies reviewed were using 223 active forms to collect energy data from the private sector which resulted in 1,462,000 annual responses and reports.

"Excluded from this number are duplicate copies and forms used to collect data which have not been approved by OMB or GAO. The amount of data collected on these forms is substantial and these agencies maintained 108 energy data systems to process the data."

GAO Report Figures

The GAO report contained more figures that indicate "the magnitude of federal energy data collection activity.

"There are 261 separate federal energy-related programs being administered by 44 federal agencies and bureaus. Four agencies account for over one-third of all energy data-related programs. The Federal government operates 98 separate computerized data bases or major files containing some form of energy-related data," the report said.

When the GAO looked at energy data collection in 1974, it concluded the only solution to data duplication was the establishment of an energy data system that would be independent of any existing agencies (See accompanying story on this page.)

"Nothing that has happened in the last two years has changed our views in that regard," the report stated.

"Federal agencies generally have continued to design information requests to fit their individual needs and efforts for improved coordination have yet to show much success."

Burdensome Data

Over the last two years, 18 energy-related bills have been enacted into law and, "in general, the legislation gave FEA significant data collection responsibilities.

"The legislation, however, did not give FEA any authority to influence the energy data collection efforts of other agencies. Thus, while FEA became a principal collector of energy data, its efforts were additive to the already existing as well as the new efforts of other agencies," the report said.

The data FEA is collecting, besides duplicating that of other agencies, is burdensome in itself, the report indicated. Since 1974, "FEA has imposed more than seven million man-hours of work on the private sector with 24 new forms," it said.

The appropriations committee was also critical of FEA's vast data collection efforts. "While some agencies had reasonably good inventories and control over their forms procedures, neither FEA nor GS has an effective inventory or control," the committee report said.

"FEA not only lacked a government-wide inventory of forms but, more significantly, did not know precisely what forms it was using. For example, FEA identified 83 forms as being in use to gather energy-related data, but at a later date FEA was unable to provide background data on 33 of these forms.

"In addition, supporting documentation of 25 forms, not a part of the original inventory, was supplied to the investigative staff," the report noted.

"The investigative staff was informed by one FEA official that even at headquarters personnel are 'blatantly flaunting laws and regulations regarding forms clearance.' FEA has been cited by industry as the major violator in the use of expired forms," the report stated.

During the House appropriations hearings, Eric Zausner, deputy administrator of the FEA, complained, "I find it a little disturbing when investigators go in; you can always find someone in an agency to say anything anybody wants."

He described a data dictionary the FEA maintains that catalogs "every single form and report that is prepared by the agency."

The GAO, however, is more concerned that data be reduced rather than inventoried by the FEA or any other agency.

GAO Proposes Independent Agency For Collection of Energy Data

WASHINGTON, D.C. – The General Accounting Office (GAO) report which found duplicative efforts in the area of federal energy information collecting practices recommended an independent data collection agency be established as "the best long-term organizational solution to energy data problems."

A similar proposal was made in S. 1864, a bill introduced in the Senate in June 1975. A committee report issued last August effectively killed the bill, however, adding an amendment to the Energy Conservation and Production Act instead.

The bill had proposed a National Energy Information Administration be established that would be independent of all existing energy agencies.

This agency would operate a centralized National Energy Information System that would coordinate data collection efforts of the different agencies and "assure the availability of standardized, accurate and credible energy information."

FEA Opposition

The Federal Energy Administration (FEA) opposed that proposal because "it threatened [its] existence and watered down [its] authority," according to Tom Laughlin, an aide to Sen. Floyd K. Haskell (D-Colo.), one of the bill's sponsors.

"FEA claimed that someone off in another agency just collecting data wouldn't understand what's needed. There were also arguments that it was more beneficial to have multiple data systems," Laughlin said.

A compromise was reached which would establish an Office of Energy Information and Analysis within FEA that would serve as "a focal point for the processing and analysis of energy data and information relevant to energy policy decision making."

FEA already has a legislative mandate to act as a focal point for energy data collection, but this mandate does not give FEA any authority to coordinate or streamline the energy data collection efforts of other agencies.

"Questions still could be raised regarding FEA's ability to establish itself as a credible source of objective energy data in view of its responsibility for energy policy analysis and development," the GAO report stated.

"Establishing a separate organizational unit for energy data collection within FEA and insulating it from energy policy analysis and development would be somewhat more difficult than in a Department of Energy and Natural Resources, but it should be possible," it added.

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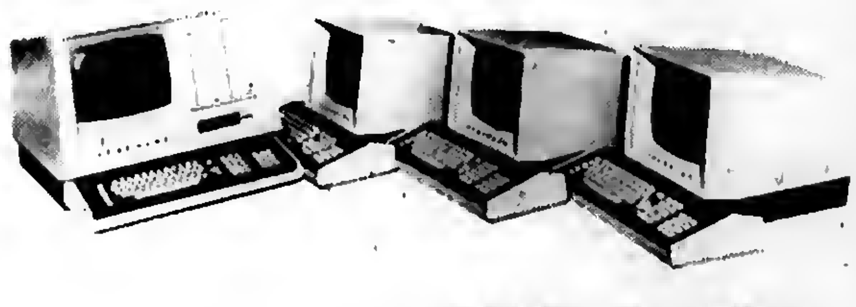

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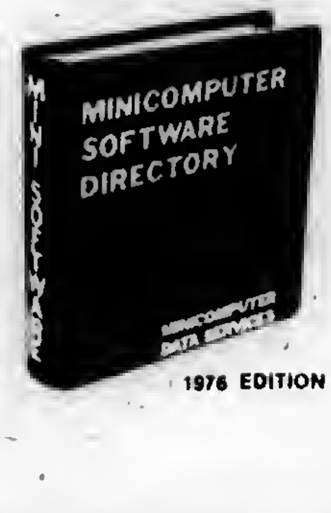

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200,000 Spotted Each Year

National Data Bank Keeping Bad Drivers off Roads

By Catherine Arnst

Of the CW Staff

WASHINGTON, D.C. – Approximately 200,000 bad drivers are being kept off the roads each year by states using the computerized National Driver Register (NDR).

Established by an act of Congress in 1961, the NDR is essentially an index of all drivers whose licenses have been suspended or revoked. When a person applies or reapplies for a license, a state can check with the NDR's data bank to see if his license had ever been removed by another state.

Forty-eight states and six jurisdictions (Guam, Puerto Rico, Panama Canal Zone, American Samoa, the Virgin Islands and Washington, D.C.) make 85,000 daily inquiries to the NDR, a total of about 22 million annually. The NDR processes the inquiries on its twin IBM 360/65s using a name-matching program designed in-house.

The result of this matching program is approximately 200,000 probable identifications annually of bad drivers.

"We call them 'probable identifications' because we are not sure if the hit is correct"; it is the responsibility of the state making the inquiry to go back to the state which allegedly suspended or revoked a driver's license to ascertain that the information is correct, according to James R. Lockard, assistant chief of the NDR.

All the states input to the system the names of drivers whose licenses have been removed, but the degree to which it is used to make inquiries varies, Lockard said. Twenty-four states check all applications for licenses, 23 check only original applications and not renewals and six check only on a "suspicious case" basis.

Florida and California do not make any inquiries (see box).

Aimed at Drunk Drivers

The register is not a data bank of all licensed drivers, Lockard emphasized – it only keeps track of bad drivers. It was the "intention of Congress that the NDR be aimed at the 3% to 4% of drivers" who may try to get a license in one state after losing it in another.

The NDR is particularly aimed at getting drunk drivers off the road, and about 52% of the probable identifications are of drivers whose licenses were removed for that offense, Lockard said.

Until 1966, the NDR only stored the names of drunk drivers, but it switched to cataloging anyone who had a license revoked or suspended for any reason because "many judges were too lenient and someone who was arrested for drunken driving would only be charged with reckless driving," Lockard said.

The NDR data base contains about 5.4 million records. It deletes a record after it has been in the system seven years if it has not received a clearing action from a state before then.

Inquiries are answered only if they are from a state's motor vehicle administrator or an individual asking for his own record. When the NDR testified at Sen. Sam Ervin's privacy hearings, that committee was "very, very enthusiastic about the register," Lockard said.

Accurate But Slow

The NDR, which costs $1.3 million per year to operate, is reasonably accurate and there have been few complaints from the states, Lockard said. The biggest problem is that it is slow.

Currently, inquiries are mailed in; the NDR processes them and mails a printout back. This process can take up to two and a half weeks, he explained.

More and more states, however, are going to a system where a license is granted over the counter when it is applied for and need instant communications ability.

The NDR surveyed its users and found 45 desire a rapid response system. A feasibility study of that is being done now, Lockard said.

Too Slow for Florida

TALLAHASSEE, Fla. – Florida does not query the National Driver Register (NDR) about applicants for drivers' licenses in that state because it "uses a high-speed data system that is not compatible with our own horse-and-buggy computer," according to an NDR spokesman.

Licenses are granted at the time of application in Florida through the use of an on-line computer system.

A total of 150 Burroughs TC 532 terminals located throughout the state allow immediate access to the state's central data bank.

When a person applies for a driver's license, his name is checked against the central file to ascertain whether he has ever had a license suspended or revoked in Florida. If not, the license is granted.

The time needed to access the NDR data bank prohibits Florida from checking an applicant's record in other states, according to Alan Cochrane, assistant director for the Division of Drivers' Licenses. There is a delay of approximately two and a half weeks between the time an inquiry is made of the NDR and an answer received, he claimed, because of the slow mailing process.

"I don't believe Florida is a haven for bad drivers," Cochrane said. The state does sometimes use the register on a suspicious case basis.

GSA Testing Grants Data Base Awaiting Approval by Congress

WASHINGTON, D.C. – The General Services Administration (GSA) has begun testing a data bank of federal domestic grants authorized by a bill which passed the Senate earlier this summer [CW, July 19].

The proposal for the data bank is now pending before the House of Representatives.

Four cities – Louisville, Ky.; Philadelphia; Omaha, Neb.; and Los Angeles – are involved in testing "Project First," a system originally designed by the U.S. Department of Agriculture.

The GSA is making this federal assistance available to these test cities through its federal information centers located in each of the four areas.

The Department of Agriculture eventually hopes to maintain data on all existing federal grants to assist communities in determining whether they are available for any particular government program. Some 600 of these programs are included in the data bank now.

If the system becomes law, the GSA would be the federal agency responsible for running it, according to Paul Kugler, director of the plans and program staff in the Department of Agriculture's Rural Development Service.

Project First will be operational for a total of three months: testing should be completed sometime in November.

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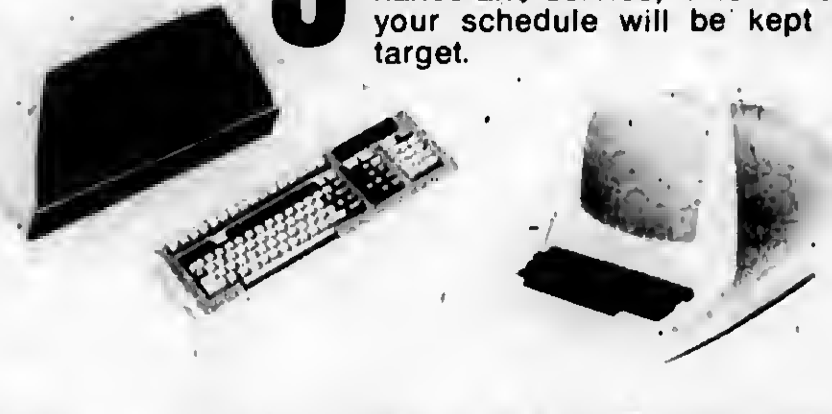

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Editorials

Maintaining Corporate Control

Corporate management must maintain continuing control of its DP operations.

This not-so-startling statement takes on added emphasis in the light of two recent news stories [CW, Sept. 13]. In both cases, events in the DP centers were directly affecting the profits of the companies and, perhaps, the survival of the firms involved.

In the first case a fraud ring allegedly was operating within the affected company to alter credit records. If the charges brought in this case are accurate, a clerk was able to access a data base containing information on untold numbers of consumers.

The integrity of the credit-granting firm was directly tied to the accuracy of the credit records. And, more importantly, credit frauds may have resulted from altered records.

A credit-authorizing company which maintains large sensitive data bases typically devotes considerable attention to internal security. And yet this system was compromised not by a member of top management, but by a clerk who routinely altered records as part of her job function.

In the second case, a company put itself in the hands of a facilities management firm which promised to assume full control over the DP operation. The client company has now charged that the facilities management firm did not provide the promised DP results and kept inaccurate reports from management.

In both situations, management apparently was under the assumption that the DP operations were functioning smoothly. Even if the defendants in both cases were acquitted of any wrongdoing, the alleged abuses are still possible despite the continuing emphasis on DP security and control.

The DP operation is the nerve center of corporate viability. Management must continually audit and control its computer systems to be eternally vigilant against unusual or unexpected events.

The lifeblood of the corporation may depend on it.

Nobody by That Name Here

The following letter, addressed to
Mr. Computerworld
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would certainly be a candidate for the *New Yorker* magazine's "letters we never finished reading" department:

"Dear Reader:

"It's been a struggle. But at last we've found you.

"After screening literally hundreds of mailing lists, we came up with a relative handful of names like yours — names of people who . . ."

Humorous, sure. But, unintentionally, it also illustrates a serious point for DP organizations, especially those that utilize mass mailings based on hired lists and those that offer the use of such lists.

Far more discrimination is needed to make sure the mailed pitch is well directed.

We all complain about the quality and the cost of mail service; perhaps one more single-digit field in a mailing list record would be enough to flag those that refer only to organizations and not to real people.

Campaigns with personalized pitches wouldn't pick up the flagged records. The cost of a campaign would be decreased; so would the volume of mail.

It seems wrong to always complain about the mail service without at least being willing to suggest an idea that might have some positive impact on the system.

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Letters to The Editor

Prime Deterrent to DP Crime Seen as Emerging DP Auditor

Regarding Alan Taylor's article on computer crime [CW, Sept. 6] and the *Boston Globe* article which he referenced, it seems to me the authors have either knowingly or unknowingly avoided mentioning one of the prime deterrents to computer crime – the DP auditor.

Although we are few in number at present and admittedly have been slow to gain recognition, our forces are growing rapidly.

Represented by such organizations as the EDP Auditors Associatipn and the Institute of Internal Auditors, our function is to review the control and security procedures employed in DP installations.

By using techniques such as Integrated Test Facility, test decking, simulation and various audit software tools, new and existing software systems continually pass our reviews.

In addition, the monitoring of DP shops' adherence to standards gives us the unique ability to oversee the entire computer department.

People should be aware that there is a profession whose sole responsibility is to act as a "watch dog" over the DP environment.

Michael I. Sobol
President
New England Chapter
EDP Auditors Association
Framingham, Mass.

300% Turnaround Unimaginable

The article by Hanks and Ingram, "Minis, Satellites Cut Marine Corps Turnaround 300%" [CW, Aug. 30], contained an error I would not be surprised to see in a daily newspaper. I was amazed, though, to see it in *Computerworld.*

Had turnaround been cut, 100%, it would have been slashed to zero. Therefore, a cut of 300% is really hard to imagine.

Steve Turek
Kansas City, Mo.

It's Dutch, Not Deutsch...

In reference to the article about Philips Gloeilampenfabrieken [CW, Aug. 30], I might judge that you people speak neither Dutch nor German.

Otherwise, you would have known that "Gloeilampenfabrieken" is a pure Dutch and not "Deutsch" (German) word. It means "light bulb factories."

Nowadays, Philips is a huge electronics company with headquarters in The Netherlands and plants all over the world, but Mr. Philips started out in Eindhoven, The Netherlands by making lightbulbs.

John Klein
Santa Barbara, Calif.

...And Extremely Dutch at That

I would like to say that Philips Gloeilampenfabrieken (literally translated as "glowing light factories") is extremely Dutch and not German, as is its computer division – Philips Electrologica.

I have not yet seen this year's Fortune 500 list, but I would not be surprised if the top two corporations are also based in good old, little Holland – namely Royal Dutch-Shell and Unilever.

Dick Barton
Hoofddorp, The Netherlands

(Other letters on Page 14.)

Data Past

Five Years Ago
Sept. 22, 1971

The main social impact of the computer between 1946 and 1971 was seen by J. Presper Eckert Jr. as the elimination of human bookkeeping. In 1960, "Half of all our manpower went into clerical work," he said. John W. Mauchly, who developed Eniac with Eckert in 1946, saw computers becoming increasingly cheaper, he stated in a *Computerworld* interview on the 25th anniversary of Eniac.

– – –

WHITE PLAINS, N.Y. – IBM continued to ease back toward bundled systems engineering with an announcement it would provide individually tailored, fully operational programs at fixed prices for users of its 3/6 CPU. IBM said it would provide RPG-II source code for programs designed under the Application Customizer Service for the users.

Eight Years Ago
Sept. 18, 1968

HARRISBURG, Pa. – In an effort to establish proper objectives, content material and appropriate terms for DP education courses in business schools here – as opposed to courses in keypunch operation – the State Board of Private Business Schools stipulated that prospective pupils at private DP schools in the state pass the IBM Programmer Aptitude Test with 36 points or better.

– – –

LAS VEGAS – Four men were arrested in connection with a $1 million Diners Club credit-card fraud which took place at local casinos here. The fraudulent cards were duplicates of real members' cards – a design which enabled charges to be processed on the club's computers, programmed to reject phony accounts.

The British Dilemma

Although the food, at least at the plebeian, fresh-cut-sandwiches, luncheon-vouchers-honored-here level, is kilometers from the French standard, Britain too has a computer dilemma. It is one of the more civilized countries, where people have learned to ease the frictions caused by limited space and resources and a large, poorly-distributed population, with many little courtesies and a lot of peaceful queuing. I have many, many friends there, from big shots like Boz Ferranti and Reay Atkinson to youngsters in the software houses. I read their computer papers, including the one associated with CW; I belong to their computer society; I love 'em dearly. But wow! do they have problems: economic, social – and technological.

Unlike the French, the English were early in our art. Babbage – not von Neumann, not Aiken, not even Herman Hollerith – was the real Father Of Us All. Equally peculiar, and much less adept at tapping the government purse, was Alan Turing, the first theorist, the first computer scientist. Maurice Wilkes beat out the EDVAC, NPL was not far behind Sam Alexander at NBS; the very first large scale business data processing installation was at Lyons Corner Tea Houses, a year before the Philadelphia 701 and two years before the Louisville UNIVAC.

But native enterprise was miles and years and dozens of IQ points behind native ingenuity, especially in the marketing/sales arena. IBM dissolved its relationship with British Tab, National Point-of-Sale switched its Scottish factories from brass-by-the-ton to germanium and silicon, Honeywell and Burroughs made useful incursions. The Londoners and Mancunians were brave at first, and brought out LEOs and ATLASes. Component houses like Plessey, communications outfits like Marconi, separately-directed American subsidiaries like Standard T&C made contributions. Their technology was good, their WWII-generated reservoir of basic science was still full, their software artistry was terrific, and less infested with curlicues than ours. But the management thrust, the risk capital, the hot-rock salesmanship were sadly lacking. The various ventures merged, merged again, reorganized. Out of it came a single British hardware supplier; ICL, International Computers Limited.

The six or seven mergees were poorly digested – remember, the Philadelphia and St. Paul Univackers have problems after twenty years! They had to reach out to American marketing experience for top executives. Still and all, there *was* a national enterprise. There had not been the humiliation of a Bull-GE-Honeywell sell-off. And the profession, the trade, was much more concerned, much more vocal about the successes and the failures of the ICL venture than in our country.

But then the dilemma began to be clear: how to support ICL against the IBMs and the Honeywells and the NCRs? By research and development subventions? I said yes, loudly, to the concerned parliamentary subcommittee, and in many U.K. speeches. By preferential procurement – national, nationalized industry, county/regional, local government? I said no: a dangerous prop. Well, they went both ways: some direct support; vigorous but not completely effective preference in purchasing. British Airways, local councils were reluctant; the Whitehall boys had limited powers and weren't all that certain – and that is the very center of the dilemma.

Because, you see, IBM and Honeywell and NCR and DEC, and other American firms, *manufacture* in Britain. Most of them manufacture more hardware and software than they sell inside U.K. They generate local employment, pay very well indeed, and produce an export balance. I don't have figures, but would guess that the wages and salaries paid in U.K. by American computer outfits substantially exceed those paid by ICL. The trade balance thing would be on ICL's side, of course, since it sells thirty percent of its production abroad and manufactures only at home so far. I'm talking about *net* manufacture of hardware and software; both sides import a great deal of components and subsystems.

So there you have it: the "American" firms are in fact just about as valuable to the British economy and to their British employees as is ICL. Because of much better sales and support practices, they are frequently better for the British user. Is it wise to try to hold the Americans down, and push ICL? One might argue that less sales by IBM means more sales by ICL. Sure, but not as much; IBM sells magnificently, even in U.K. IBM ships its profits out – yes, but it has many British shareowners. On balance, I still think my old 1972 advice was right: feed in R&D money and leave the marketplace alone. Science and technology are what Britain needs, in every field – crutches, no!

Herb Grosch

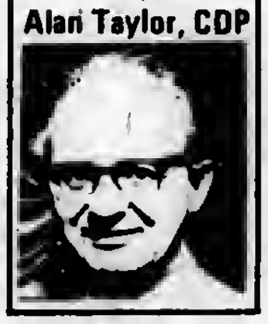
Airline Overbooking Exemplifies Classic DP Problem

Overbooking is one of the great phenomena of the computer age. Use of adjustable formulas based on various histories (calendar, day, event occurrence, weekday, overall trend, etc.) are routinely calculated for every flight made in this country by the major scheduled airlines.

The Taylor Report

By

Alan Taylor, CDP



Overall, the system works well. For every 51 passengers overbooked, only one was bumped from a flight, according to 1975-76 figures presented by Richard Ferris, United Airlines president.

This is a useful figure, showing a 2% failure rate for the system. But before we cheer and look the other way, we should take a look at the overall problem.

The overbooking problem is certainly one of the classic business/computer problems and, while being one of the first, it will not be the last. It is useful for all computer professionals to consider its characteristics to see the problems that are going to be involved in computer solutions and optimizations in many areas.

In the past this was not possible because the airlines kept much of the necessary knowledge from the profession. Now, under the pressure of the courts, some of the figures are being released.

Overbooking Definitions

The best available data comes from United, where the overbooking problem is now defined as deliberately confirming seats beyond capacity, according to Ferris. This is very different from the Civil Aeronautics Board (CAB) definition, which is based upon the number of confirmed bookings not honored.

How these differ can be realized by considering the odds. Bumped passengers on United totaled about 1 in 2,000, but overbooked seats were 1 in 30. It is clear that the overbooking problem is much bigger than the bumping problem.

In fact, Ferris' definition does not go far enough. While he said a million overcapacity seats were booked on "certain" flights, he did not reveal the total capacity of those flights or of the flights on which anyone was bumped.

These total capacity figures are important in sizing the problem. Overbooking does not just affect the passengers who are confirmed when there is no space available – it affects all the passengers on the plane.

Here lies the difference between the overbooking system and the more conventional wait-list system. No passenger on an overbooked plane really gets a confirmed seat under overbooking. The choice as to which passengers are to be bumped is not restricted to the late bookers, but can be anyone.

Another figure Ferris did not reveal is the number of confirmed bookings United gave out. However, a reasonable estimate of this can be obtained as follows from the figures he did give.

Number of Bookings Issued = Number of Bookings Honored + Number of Bookings Dishonored + Number of No-Shows

Ferris said 30,250,157 bookings were honored, 16,545 were not and United experienced 10% to 15% no-shows. Using a 12.5% no-show figure, this equals about 34 million bookings accepted.

We can now size the problem as follows:

Bookings Issued Within Capacity = 33 million.
Bookings Issued Outside Capacity = 1 million.
Passengers Put at Risk = 10 million.
Passengers Not Showing = 5 million.

That's the best way I can see to size the problem. But what about the computerized solution? What are its parameters?

Although Ferris' figures are the best available, they are incomplete. They don't show the number of overbooked passengers who asked for room on the flights. However, this can apparently be worked out from the number of overbooked passengers carried and the number bumped. These, together with the number of overbookings, provide some idea of the solution. The data follows:

Bookings Issued Outside Capacity	**1,081,082**
Outside Capacity No-Shows	**222,100**
Outside Capacity Seated	**842,637**
Outside Capacity Bumped	**16,545**

Other possible solutions could give other figures, but at least this gives the data of the current solution. Current figures, however, only reflect the current position. What about the future? Are our techniques getting better? Can we expect next year's figures to be better? Or worse?

Here we have the greatest amount of missing data. We don't have any history of the prior success of United or any other airlines in handling the system. We do know that in aggregate the number of bumped passengers rose from 94,000 to 102,000 between 1974 and 1975, according to CAB reports. But what happened to capacity?

The overbooking problem catches anyone, as seen from this file photo of a group of overbooked people, including the writer, milling around an airport counter on the way to a DP conference. The solution was an all-night bus journey.

Certainly any increase is grounds for suspecting the worse; so are the current trends in airline travel. Ferris commented that 1976 is an unexpectedly strong year – with the increase in flights actually observed nearly double (at 10.5%) the expected 6.5%. And 1977 is going to be strong also.

These figures also tend to suggest that more flights are going to be overbooked in the future. In conjunction with the CAB reports, they suggest that some other solution or some improvement in the current solution would be of help to everyone.

The search for improvement appears to be the goal of any computerized optimizing technique such as overbooking. Probably some of this column's readers have ideas about it or know who else has published material on this area. Certainly some will know why publication of material is not always reliable or carried out.

I'd be glad to hear from all sides. From the computer technical area this is the real problem: How do we best improve an optimizing solution while it is running?

Overbooking is one such case – but there will be others. If we understand this, all problems may be helped a little. So I'll wait to hear from you.

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Letters to the Editor

Taylor Column on Privacy Showed What Model Can Do

I would like to compliment Alan Taylor on his article, "Model Pinpoints Total Cost to Implement Privacy Act" [CW, Aug. 23]. The explanation of the model was very clear and, in my opinion, gave the reader a good feel for what the model can do.

It should be pointed out, however, that most of the work that went into model development was accomplished by Robert C. Goldstein.

My participation has been that of a user who has fine tuned the model to fit specific personal data base considerations.

Henry H. Seward

D.P. Management Corp.
Lexington, Mass.

Question Inaptly Phrased

Regarding the letter by Anita N. Benson [CW, Aug. 16], the question at the end of the letter was inappropriate to computers.

". . . Would you prefer mass-produced Mediterranean modern or a handcrafted piece, made with pride, that will last a lifetime and be a joy to use?" would have been more aptly stated as "Would you prefer a handmade high-performance car or a mass-produced Chevy Nova?"

The high-performance car is nice, but what do I do when I need service?

A small businessman cannot afford to rewrite his programs every time the tax rate changes and he cannot afford to call a software consultant of Benson's caliber every time a program needs maintenance. Maintenance is more important than a beautiful system.

Before Benson asked her question, she should have realized most furniture (and computer programs) will be used in an office reception room. For use there, it must be cheap and easily replaced.

The computer is a tool like a wrench or adding machine, not a work of art in itself.

William L. Roberts

Coatesville, Pa.

It Also Manufactures It

In reference to your coverage of automatic fingerprint identification technology [CW, Aug. 9] we wish to emphatically correct one item in the article.

The ". . . hardware already developed by Calspan" is also manufactured by Calspan, which has patents issued and pending upon the hardware and which owns the registered trademark "Finder" for these fingerprint readers. "Lifter" is also a trademark of Calspan Corp.

C.W. Swonger
Vice-President

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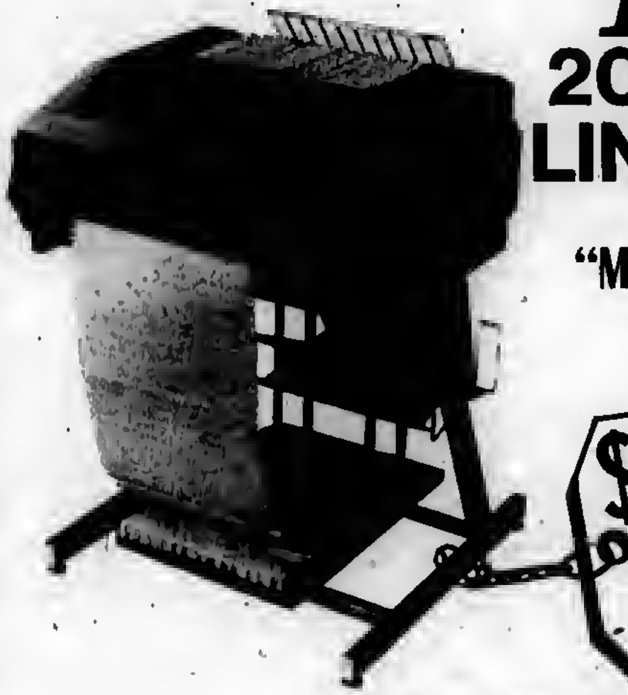

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Although It May Not Be Anything New

'Software Physics' Standardizes DP Operations

By Barry A. Stevens
Special to Computerworld

DP management currently relies on an apparently haphazard collection of definitions and methodologies to perform required operational functions such as forecasting, equipment planning, cost allocation and operational analysis and improvement. This has created a situation in which different people working at the same installation and solving the same problem can obtain different results and reach different conclusions.

This has, to say the least, an unsettling effect on management; it is not a very satisfactory way to run a business.

Several years ago, Ken Kolence set out to correct this situation through a carefully constructed set of definitions and relationships intended to describe basic terms, concepts and procedures used to manage the DP function.

Drawing heavily on analogies between the physical sciences and the behavior of DP systems, Kolence named the new discipline "software physics."

Literature describing software physics concepts began appearing in trade publications as early as 1972, but did not become generally available until Kolence founded the Institute for Software Engineering in 1975.

The institute publishes materials on software physics and conducts a nationwide seminar series on the topic. These activities have attracted considerable attention.

The steadily increasing visibility of software physics has, understandably, evoked reactions from the DP community, and it is those reactions that this article sets out to explore. In preparing this material, we talked with vendors of hardware and software monitoring tools, hardware system vendors, students in the institute's seminar series, organizational and individual supporters of the institute's activities and collected a reasonable sampling of professional opinion from the DP community.

During this process, we encountered quite a spectrum of opinion ranging from enthusiastic, almost messianic support to overwhelmingly negative "knee-jerk" reactions.

The picture which emerged from this effort was one in which the scope and potential usefulness of software physics was greater than its most vehement detractors allowed, but less than envisioned by its most enthusiastic supporters.

Unlike most contributions to Computerworld, the accompanying article was read prior to publication by a number of people deeply involved in computer performance evaluation, including Ken Kolence.

While the author made a number of changes to his original text, he recognizes that what he has to say will still bother some people. Hopefully they will feel free to respond so a clear picture of software physics can emerge.

Comments on this article can be sent to Don Leavitt, Associate Editor/Software, Computerworld, *797 Washington St., Newton, Mass. 02160.*

It was obvious that extreme reactions, on both sides, were not very well thought-out, and need refinement and further investigation to provide substance. Finally, it became apparent that significant practical application is required if the premises underlying software physics are to be proven and ultimately accepted by the DP community.

But what is software physics? What is it intended to do and what are its limitations?

Definition of System

Software physics defines a computing system in terms of processors and storages. Anything that can execute instructions is a processor, including central processors, channels and control units. Anything that can hold data is a storage, including buffers, high-speed cache memory, main storage, disks, tapes, cards and printer paper.

When programs are run, work is done, in software physics terms, when program instructions cause processors to move data from one storage type to another (the precise definition is that storage is *altered*).

A workload is described in terms of the amount of work required of various elements of a DP system. This may be derived through the construction of a descriptive vector for each job, then for the workload as a whole, and can assume the form:

	SEC CPU	IO1	IO2	IO3
JOBAAA	100	1,000	0	1,000
JOBAAB	1	10,000	5,000	400
JOBAAC	10	2,500	150	2,400

Each vector may then be accumulated into a total using an equation of the form:

$$W = a_1 \times CPU + a_2 \times IO_1 + a_3 \times IO_2 \ldots$$

where the constants are empirically derived. These constants describe, in effect, the ability of the hardware system to do work for the specific workload being characterized.

If the constant values are correctly chosen and the data elements are converted to units of software work, the resulting values of software work, W, will be in terms of "works," "kiloworks" or "megaworks," the unit of work used throughout software physics.

These values, using computational procedures defined in software physics materials, can be used to allocate DP costs, determine system capacity requirements, calculate system capacity and form the basis for workload forecasting and equipment planning procedures.

The equation for software work is of

The capability of a given system to effect that transfer is called the "power" of a system. The amount of power that a specific configuration is capable of delivering to a specific workload is largely determined by the workload and determines the execution time required to process the work. Execution time is a very precisely defined term in software physics.

The entire process is described using equations of the form:

$$P = \frac{W}{T}$$

Notational complexity arises when this relatively simple equation is applied first to subconfigurations within a computing system, then to the system and workload as a whole.

(Continued on Page 18)

Some OS/MVT Support Seen Despite Phaseout Announcement

WHITE PLAINS, N.Y. – Although IBM recently notified users it would drop the 360-based operating systems, OS/MFT and OS/MVT, from Class B to Class C support next year [CW, July 5], it hasn't given up on these users yet.

One of the company's "blue letters" (for internal use only) dated in late August described a programming Request for Price Quotation (RPQ) – or specially priced piece of software – that has been designed to support IBM 3350 and 3330-11 disk subsystems under OS/MVT Release 21.8 on large-scale non-virtual 370s.

Cataloged as 2799-ARG, the package is considered by IBM to be a "unique alteration, not generally applicable" to all users. It therefore carries a monthly license fee of its own – $300 – although the operating system and most other device support software has traditionally been provided free by IBM as "intrinsic to the functioning" of the computer system on which it is to be used.

While the timing of the package availability has been a surprise to some observers, the pricing has not. IBM seems to be trending toward, in effect, breaking the operating system apart and putting price tags on the pieces, they noted.

Ultimately there will be a small skeleton and users will have to become "far more sophisticated" in order to "flesh out" that base with the right add-ons, they added.

The capabilities of 2799-ARG are "interesting" to some observers and appear to be aimed at third-party lessees. The package does not, for example, support any of the IBM 2300 line of disk units except the 2314, nor does it support the original 3330s or the 3340 disk modules.

It does not function in the OS/MFT mode, nor does it support TSO swapping or the "starter system" facility for the 3330-11. This latter omission means users require a "standard" 3330 for system generation; if the starter was in place, they could work from the 3330-11.

Commenting on the RPQ, a spokesman for Itel noted that his company has provided support for the 3350 and the 3330-11s on its modification of the operating system and that the Itel software costs only $200/mo.

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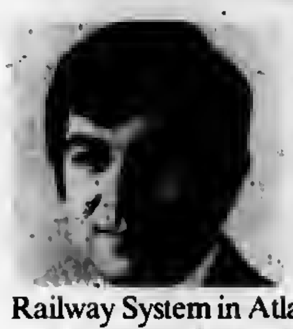
Social 3:00-4:00 p.m.

Opportunity to discuss specific questions in depth with members of the Cullinane Corporation Technical and Management Staffs in a relaxed and casual environment.

Seminar Leaders

Robert J. Davis — Mr. Davis is Regional Marketing Manager for Database Systems. He has extensive experience with most aspects of database system design and usage, and has held key positions with both IBM and CINCOM. He is responsible for the marketing of database products in the U.S. and Canada, analyzing competitive products, and finding new markets for database technology. Mr. Davis holds a B.S. degree from the University of Akron.



William E. Linn — Dr. Linn is a member of the Cullinane Corporation Senior Technical Staff. His responsibilities include IDMS training, database consulting and technical marketing support. He was previously with Southern Railway System in Atlanta where he was deeply involved with database administration activities with IDMS. He has his Ph.D. in Computer Science from the University of Michigan and has been associated with the Georgia Institute of Technology teaching data structures and list processing techniques.

Raymond J. Nawara — Mr. Nawara is Southwest/Plains Area Manager of Cullinane Corporation. He has had extensive experience with the design of health and patient-care systems. Previously he was the Data Base Administrator at the Health and Hospitals Governing Commission of Cook County, Illinois where he had extensive experience using IMS. He has consulted in Database Applications for a variety of clients. Mr. Nawara is a graduate of the University of Houston with a major in Mathematics and Computer Sciences.

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HP Puts APL on 3000 Series II With Software/Firmware Duo

PALO ALTO, Calif. – Hewlett-Packard Co. (HP) has extended the capabilities of its HP 3000 Series 11 with the introduction of a multiuser APL language package (APL/3000) and an optional CRT-based terminal with a full APL character set.

The software/firmware combination that makes up APL/3000 is said to be capable of supporting 12 or more concurrent users, each with an APL workspace that is effectively limited in size only by the available disk space.

For users who may not yet be comfortable with the APL notation, HP includes a facility – called APLgol – which allows the definition of functions in simpler terms.

Using keywords to define the functions, APLgol combines the maintainability and reading ease of structured programming with the power of APL, HP said.

The language processor underlying APL/3000 is a "dynamic, increment" compiler and not "merely" an interpreter, the company emphasized. This distinction means that, once compiled, object code is available for use again and again so long as tests for appropriateness are met, a spokesman explained.

The use of fully compiled code can cause "dramatic speedups" in the execution time of large programs, particularly those with much internal repetition, he added.

The APL/3000 Editor is a full text editor as well as a full function editor, HP said. Commands are English-like words: some like UNDO, which returns a programmer to his position before the previous edit command, are unique to APL/3000, the spokesman claimed.

Since APL is treated as a standard language subsystem under the HP 3000 operating system, users are free to use any of the other languages while APL operations are in progress, HP said. In that connection, the company noted the HP 2641A terminal, being introduced now, can be switched from APL to Ascii to support the user's language choice at any time.

The CRT on the 2641A has a high resolution, allowing immediate and clear display of APL characters created, in some cases, by overstriking two individual keyboard characters, HP said. The keys generally utilize a bit-pairing approach with an Ascii and an APL character on each, the spokesman added.

The 2641A is microprocessor-controlled, allowing user-defined function keys; when used in Ascii mode, it is teletypewriter-compatible in asynchronous or bisynchronous operations, HP said.

Cost of the firmware/software APL/3000 package – which can be field-installed on existing HP 3000-IIs – is $15,000. The 2641A terminal costs from $14,100 up depending on memory and other options.

First deliveries of APL/3000 and the 2641A are expected in November, HP said from 1501 Page Mill Road, Palo Alto, Calif. 94304.

Round-the-Clock T/S Ready for D.C. Users

RESTON, Va. – Accounting firms and small businesses in the Washington, D.C., area may be able to get the computing capability they need through a fixed-price, round-the-clock time-sharing service from Dynamic Computers, Inc. (Dynacom).

The seven day/week service provides unlimited use of a Westinghouse 2500-based mini system located here over dial-up lines. Software applications already available include inventory, accounts receivable, payroll and general ledger, Dynacom said.

Users may write additional programs, apparently in RPG or Fortran, or modify the existing ones, which are in Fortran.

A "daisy-wheel" terminal, based on the Diablo print mechanism, and on-line storage of 6,000 disk records as well as use of the software is included in the $500/mo cost of the Dynacom service.

Communications costs are not included, the spokesman emphasized.

More disk space is available at the rate of $25/mo for each additional block of 6,000 records, he said from 11800 Sunrise Valley Drive, Reston, Va. 22091.

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'Software Physics' Standardizes Operation Jobs

(Continued from Page 15)

essentially the same form as that used by existing job-accounting methods to compute the charges for a job; Boeing Computer Services, Inc.'s (BCS) Sara package, for example, computes the Computer Resource Unit in essentially the same form.

The internal computation of job charges in Value Computing's packages is of a similar form; the computational method behind IBM's Service Unit in the System Resource Manager is essentially the same as well.

In software physics, however, although the same form is used, the elements of the table are first converted to units of software work. I/O activity, initially in EXCPS for example, may be converted to work by multiplying the number of EXCPs by the average block size of the records moved. The result when the elements of work are summed up for each job is intended to be a value of total work that is invariant.

BCS has implemented this method in the latest version of the Sara job-accounting package. According to BCS, the constants used for the computation of software work are available to Sara users who are members of the Institute for Software Engineering.

An important premise behind software physics is that the resulting value for software work for any job is the same, no matter what, unless the program or data are in some way altered.

It will be interesting to follow published results as Sara and the other vendors' packages are used to determine the value of software work for actual workloads. If the computed value of work actually remains constant for each job, a major problem in accounting for machine resources will have been solved.

The responses to software physics have been quite varied. A common response was voiced by John Caron, an analyst at the Federal Computer Performance Evaluation and Simulation Center, who feels "software physics is the same old good management topics with a new label."

Mike Morris, an independent consultant, concurred: "Software physics contains nothing really new. It does provide a well thought-out, structured approach [to common concerns in DP] using a consistent notation. I look forward to applying it to practical situations."

There are, however, at least two interpretations for the "nothing new in software physics" response. The first is that software physics really is nothing new.

In the second case, observers believe software physics doesn't *do* anything new in DP – equipment planning, cost allocation, workload characterization and capacity analysis have been around for some time.

But software physics provides a methodology for performing these functions using standard definitions, uniform notation and defined computational procedures. And *that* is new to DP.

In the opinion of many observers, software physics can make a positive contribution even if it does not contain anything new. Philip J. Kiviat, chairman of Sigmetrics, feels "the biggest contribution of software physics is in the organization it provides . . . and that is a healthy thing. I'd like to see more written, especially by those who are trying to use it."

And, in what may prove to be a most significant view, Dan Momjian, vice-president for banking systems at the Bank Administration Institute (BAI), described Kolence's work in software physics for BAI as "an outstanding job of cost allocation."

Treatment of time, not particularly easy in a multiprogramming environment, is still sticky in software physics. Precise definitions are provided for execution time, for example, which in a single-thread environment is equivalent to the single-thread processing time but, in a multithread environment, is neither the single-thread time nor the elapsed time for the program.

It appears to this and other observers that processing delays are not accounted for using software physics and must be introduced by using additional measurement projects to determine such delays and then combining those results with software physics to arrive at a true turnaround or response time.

If this is true (and Kolence insists it is not true) and service levels are an important part of any capacity management system (as all seem to agree), this is seen as an important shortcoming in software physics.

Another response to software physics is that it needs to be brought down to a practical level and that additional work is required to demonstrate the validity of basic concepts and to provide practical illustration of its utility.

Momjian noted "technicians have responded very favorably, while users and management haven't responded as quickly . . . Kolence's work needs a layman's interpretation."

And Joe Magliolo, section manager at American National Life Insurance, described a potential use for software physics at his installation: "I plan to study it more and introduce the notation at our installation. Its use in workload forecasting, for example, should make it unnecessary to continually test assumptions made and reasoning used in the preparation of a forecast, thus simplifying the process."

Other tests of software physics are in progress, including use of software physics methods to compute billing rate constants, comparative analysis of tape drive performance and benchmark comparisons between predicted and actual values of software work.

The reaction to software physics is pretty much as can be expected at this point. In spite of what some observers consider to be limitations in its use, software physics has still, in the view of others, made a positive contribution.

Stevens is an independent performance consultant and an associate editor of EDP/Performance Review, *published by Applied Computer Research of Phoenix, Ariz.*

'Cuffs' Ready for In-House Use

WAKEFIELD, Mass. – The Combs-Unangst Financial Forecasting System (Cuffs), previously available only on time-sharing networks, is now available from Sofco, Inc. as a package for in-house Digital Equipment Corp. Decsystem-10s and -20s.

Said to support a user language "very close" to English and to be easier to use than other similar systems, Cuffs handles complex problems such as seasonality, constraints on capitalizations and least-squares regressions as well, Sofco claimed.

Said to be capable of consolidating 500 subsidiary items at multiple levels, Cuffs costs $20,000 to $25,000. Monthly lease plans are available from Sofco at 4 Lakeside Office Park, Wakefield, Mass. 01880.

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Six Ways to Go About It

Personal Initiative Only Way to Learn Documentation

By Joseph T. Rigo
Special to Computerworld

A lot of companies have decided it is finally time to do something about their documentation problem. And they are going about it in a most peculiar way.

First, they give the job to a person who has no prior experience or training in systems documentation. Next, they assign this person to work under a manager who hasn't the foggiest idea of what to expect from a technical writer.

And then they issue the commandment, "Go forth and document!"

Characteristically, the writer is a bright young person who digs in conscientiously and really tries to do a good job. Sometimes it works. More often it doesn't.

The Spark

The accompanying article was written in response to the following letter, which our reader asked us to forward to the author:

Dear Mr. Rigo:

I caught your Reader Commentary ["Too Many Examples Better Than Not Enough for User" (CW, Aug. 16)] and noticed you are now the president of a documentation consulting group.

Would you please tell me where I can get some good guidelines on how to document a system? I work for a large insurance firm, am their only tech writer, their first one. They hired me on the strength of my potential and don't know a damn thing more about documentation than I do.

If you could steer me in any useful direction at all, I would vastly appreciate it!

Gratefully Yours,
(Name Withheld)

There is no place to go for easy answers. There is a lot of literature about how to document single programs, but the subject of large corporate and governmental applications has barely been touched.

So, given this general situation, what do you do?

- *Learn to program.*

You don't have to become a great programmer, but you must be able to go into a listing to find an answer you need. You also must be able to understand what the people around you are talking about.

Most importantly, you must be able to use any system you are documenting. This is the only way you can find out how it really works.

- *Go live with your users.*

Get an assignment to document clerical procedures in one of your user departments. Find out why they hate the systems staff. Learn what really interests them in a new computer system.

While you are at it, get some of the standard technical writing books and experiment with different techniques. Learn the difference between good documentation and good writing.

- *Join a development project.*

Join the team full-time when it is starting to develop requirements for a new system. Stick with it through the last user manual. There is plenty of documentation to be produced, and you can free a systems analyst for active duty.

Be careful, though. Other members of the team will ask you to fix up the spelling and grammar in their reports. This sort of help will improve their productivity enormously but don't let it take up more than 10% of your time.

- *Join Sicdoc.*

Sicdoc is the Special Interest Committee for System Documentation. Information is available from the Association for Computing Machinery, 1133 Sixth Ave., New York, N.Y. 10036.

- *Learn about the tools of your trade.*

Learn to produce Hipo diagrams, reference charts, tables and illustrations. Find out about text editors and automated documentation programs. They won't help you produce the first draft, but they save a lot of time in updating and maintenance.

- *Develop different styles for different users.*

Computer operators don't have time to read. They want diagrams with symbolic labels.

Programmers never look at anything except a listing. You have to figure out how to guide them to the right one when the system has 148 modules. You also have to tell them what those funny variable names stand for.

In your spare time, work with them to develop standards for programming so the listing will be structured in a sensible way.

The Human Connection

Managers like to see Gantt charts about time and cost. They can't read anything longer than one page. System documentation puts them to sleep – especially right after lunch.

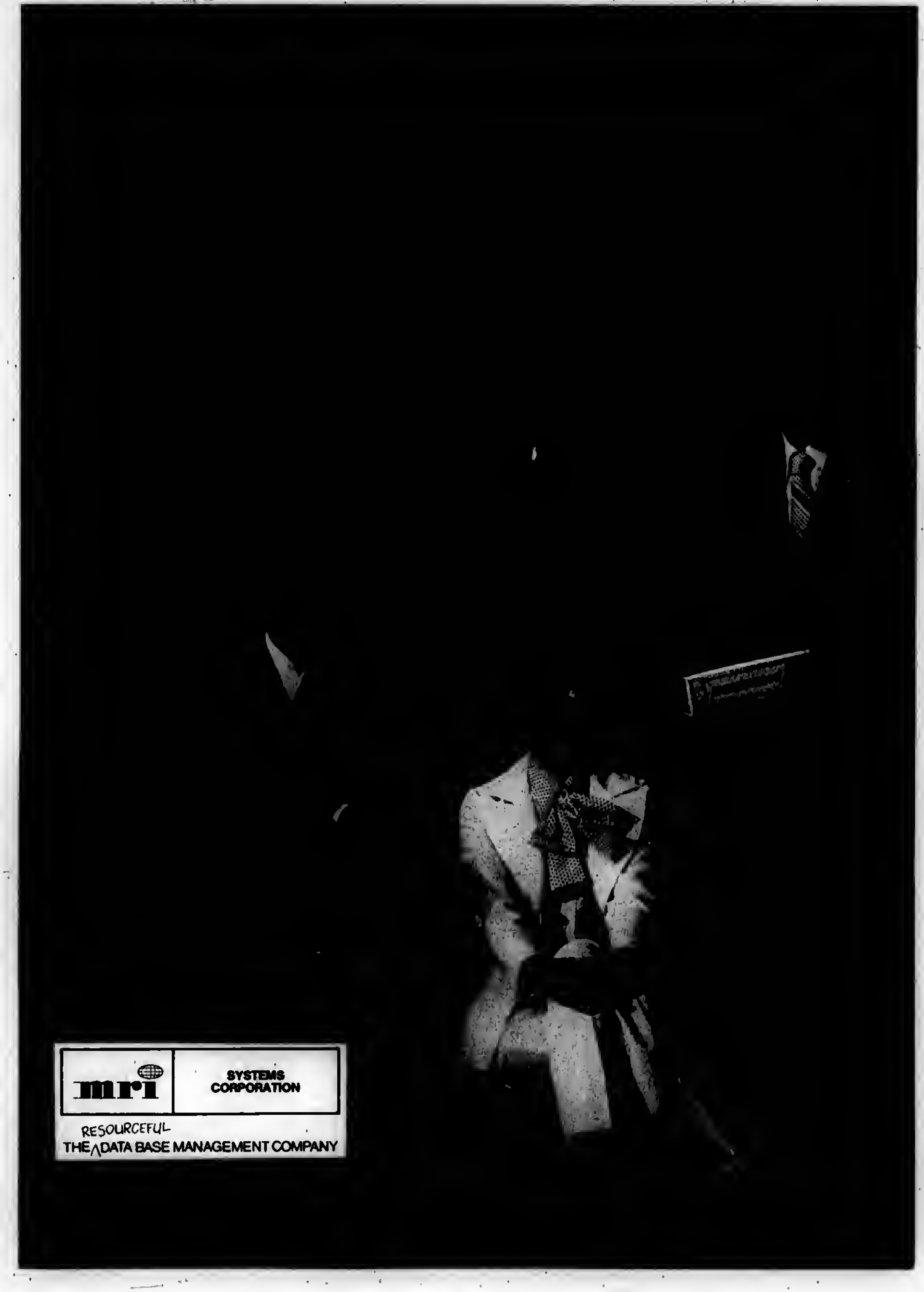
After you have gone through all these steps, you are ready to tackle your company's documentation problems. You have also become an experienced systems documentarian, and you are ready to move on to a company that pays better. IBM and Digital Equipment will go up to $30,000 for a good writer these days.

If, however, you decide to stay where you are, there are only two things to do.

The first is to forget all the generalized good advice that I have just given. You don't have time for it.

The second thing is to find an interesting system and start churning out the paper. In no time, you will have six people working for you, and you will be able to give them much better guidance than you ever received.

Rigo is president of Sysdoc, Inc. in New York City.



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Data Briefs

MFE Buffered Terminal Based on Intel Micro

SALEM, N.H. – MFE Corp. has introduced the Model 5000 buffered tape cassette terminal, built around the firm's earlier Model 250B tape cassette transport system.

Buffering, editing and communications in the Model 5000 are done by an Intel 8080A microprocessor.

Programmed high-speed search and edit functions, as well as communications capability, are standard features.

The Model 5000 is said to conform to Ansi Ecma standards with tape speeds of up to 120 in./sec on cassettes capable of holding 175,000 characters of formatted data.

The system utilizes read-after-write for error detection and employs data correction routines, the company said.

The Model 5000 costs $1,995 with delivery in 30 to 45 days from MFE at Keewaydin Drive, Salem, N.H. 03079.

Bedford Modex Includes Hytype II

BEDFORD, Mass. – Bedford Computer Systems, Inc. has introduced the System 75 Model X, a hard-copy data terminal utilizing the Diablo Hytype II 45 char./sec printer.

The terminal, which also incorporates an Intel 8080 microprocessor controller, operates as a desktop unit with a 96-element upper/lower case Ascii character set.

Standard features include advanced graphics, a buffer monitor allowing operation at 1,200 bit/sec, print enhancement, reverse printing and full format controls, the company said.

The Model X is priced at $3,395 with delivery in 45 days, the vendor said from 3 Preston Court, Bedford, Mass. 01730.

Digilog Enhances Telecomputer II

HORSHAM, Pa. – Digilog Systems, Inc. has an upper/lower case character set for its Telecomputer II CRT display terminal.

The Telecomputer II is a teletypewriter-compatible terminal that can use any size CRT monitor for its visual output and handles up to 10 monitors simultaneously, the company said.

The upper/lower case character set is available as an option for the basic $1,295 terminal for $250, it noted.

The terminal includes such features as switchable line length of 40 or 80 characters, switchable operation between half- and full-duplex modes and switch-selectable transmission rates of 50- to 9,600 bit/sec, according to a spokesman.

Digilog Systems can be reached at Babylon Road, Horsham, Pa. 19044.

Faced With Growing Number of Claims

Insurer Testing Large Terminal Net

By John P. Hebert
Of the CW Staff

HARTFORD, Conn. – Premeditation characterized a large insurance company's move to a computer-based communications network which should expand its claims-processing capabilities for medical and dental policyholders.

Aetna Life & Casualty here has installed 58 intelligent communications terminals on its way to bringing up 1,000 terminals in 40 branch offices throughout the country in the next 16 months.

Robert Gilligan, the officer in charge of the Aetna Computerized Claims System (Aecclaims), explained the reason for the system's implementation was to prepare for the possibility of national health insurance and to help with a workload that has been steadily growing in the last 10 years.

With the rising volume of dental coverage lately, the number of people processing the claims was rising, but with diminishing returns, he said.

With 4,000 employees already in Aetna field offices, the unit cost of processing each policy was increasing disproportionately. Coupled with a high turnover rate of field-office clerical employees, these factors left Aetna faced with "one of those problems you can't solve with more people," Gilligan said.

So, at the first signs of these growing pains three years ago, Aetna began developing Aecclaims.

40 Vendors Solicited

Proposals were solicited from over 40 terminal vendors, with 18 to 20 responding. When the field was narrowed to four vendors' machines, each was installed at Aetna's Civic Center pilot office here and tested for six months.

The pilot office now has about 60 Bunker Ramo Corp. (BR) Model 90/17 terminals and associated BR Model 90/97 printers operating at 120 char./sec.

About 150 man-years of effort have gone into Aecclaims, Gilligan said. The terminals are tied to the company's 4M-byte IBM 370/168 mainframe located at the headquarters office two miles away by leased Bell 4,800 bit/sec lines and Bell 208 data sets, according to Jack Abbruzzese, the insurer's telecommunications specialist.

Before entering the 370/168, the claims data passes through a BR Model 90/20 minicomputer communications controller and a Memorex Corp. 1270 telecommunications control unit, Abbruzzese said.

In the future, other branch offices will have 16 to 60 terminals installed depending on claim volume.

The new system will enable Aetna to hold the line on claims processing and turnaround time, in addition to maintaining nationwide uniformity in claims handling, Gilligan said.

"We're not the first major insurer to use a computer for group claims, but we feel Aecclaims gives us the most advanced system of its type in the industry," according to William W. Waters, vice-president of the Life and Health Claims Division.

Aecclaims can not only process both medical and dental claims but, because it is tied into existing computer systems, it "gives us single-computer access to the benefit provisions of each of our policyholders, the claim files of each covered employee and the data on current charges for medical and dental services," Waters said.

"Most of the systems we are aware of require separate computer operations to get this same data and also require a good deal of manual support," he added.

Almost a Personal Letter

Changes in the Aecclaims data bank can be readily made and individual employee files are automatically updated in the regular claim payment procedure. In addition to eliminating computation errors, Aecclaims offers a new method of explaining to claimants how their payment was determined, Waters said.

"We call it an "Explanation of Benefits" form, but it is about as close to a personal letter as a computer is capable of producing," he explained.

Through the terminals, the field office submits the claim data and learns in seconds the amount of payment. Aecclaims then prepares and mails the claim draft and Explanation of Benefits form, updates its records and mails microfiche copies of the entire transaction to the local office.

Each office will be equipped with several data terminals, each with its own keyboard and CRT screen and one printer. When a claim is presented, the terminal will be used to retrieve the family's previous claim history from Aetna's computer, and the information will be immediately displayed on the screen.

Abbruzzese would like to eventually see his firm adopt Bell's Dataphone Digital Service (DDS) capability to achieve better performance and data checks.

And, in the future, Aetna will probably go to integrated service for Aecclaims and its separate Life and Casualty networks, which support 200 terminals and 450 terminals respectively, he said, adding he is waiting for IBM's Synchronous Data Link Control protocol.

"There would be tremendous cost savings with consolidation," Abbruzzese said.

Infotron, Timeplex Gain Honors In User Survey on Multiplexers

By John P. Hebert
Of the CW Staff

DELRAN, N.J. – Infotron Systems and Timeplex, Inc. units gained perfect scores for both overall performance and hardware reliability in a recent survey on multiplexers conducted by Datapro Research Corp.

Despite the large estimated size of the installed base of such equipment, Datapro received only 33 usable responses. In its report of the survey results, "All About Data Communications Multiplexers," the research company conjectured the reason for this was that the survey didn't "reach the personnel responsible for handling multiplexers," and not that there are few units in use or that readers didn't bother to reply.

Users who did respond to the survey rated the devices on a scale from 1 to 4, with 1 representing "poor" and 4 representing "excellent." Datapro assigned weighted averages to these ratings in each of five categories – overall performance, hardware reliability, maintenance service, ease of installation and ease of expansion.

Users gave the Infotron time-division multiplexers (TDM) and the Timeplex T-4 TDM marks of 4.0. The Timeplex T-20 was rated 3.8 by four users of 19 units.

In the area of hardware reliability, the Infotron 240 and other Infotron multiplexers gathered ratings of 4.0, as did the Timplex T-4 TDM.

Runners-up in the reliability category included GTE/Lenkurt's frequency division multiplexer (FDM) with a score of 3.7 and other units in the Timeplex series of TDMs.

The Infotron 240 gained the highest marks from users in the remaining categories of maintenance service, installation ease and expansion ease, with marks of 3.8, 4.0 and 4.0 respectively, the report said.

Codex Corp.'s 900 series TDM received the second highest grade in the area of maintenance with a 3.6 rating. It was closely followed by the Timeplex T-4, which was given a 3.5 score from two users with three units installed.

(Continued on Page 23)

A new Recorder to talk about

We'd like to introduce you to our great new cassette data recorder, the AJ 730. You can use the AJ 730 off-line to edit or store information: on-line to communicate to remote computers or terminals, or in a network of data communication devices including other AJ 730's.

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For Dispatch and Monitoring

Auto Club Speeds Services With Mini-Based System

ST. LOUIS – Emergency road service at an auto club's communications center here has reportedly become more efficient with the help of a minicomputer-based communications terminal dispatch and monitoring system.

The Computer-Aided Support for Emergency Road Service (Casers) system was conceptualized by the Auto Club of Missouri and developed by the club and a St. Louis-based consulting firm, according to a spokesman.

As far as the club can determine, it is the first and currently the only computerized dispatching/monitoring system for emergency road service, he said.

The club considers the system to be "an optimum combination of automated processing and human judgment" and plans are under way to implement it in the club's Kansas City communications center, the spokesman stated.

Casers is based on a Texas Instrument (TI) 980 minicomputer with 64K bytes of 18-bit main storage equipped with a specially modified DX980 operating system and special applications software, he said.

Peripherals consist of a 2.28M-byte Diablo Corp. Model 31 disk for loading at the center here; a TI-built industry-compatible 45 in./sec tape unit and a 320 char./sec Centronics Data Computer Corp. matrix printer.

A constellation of 29 TI Series 91L CRT terminals are also located at the office here, he added.

Incoming calls are routed automatically to one of a group of service counselors, each of whom has a 91L CRT terminal for data entry.

Terminal Transactions

Information about the service requests including members' names, phone numbers and description and location of their automobile is logged on an automatically displayed form template in any order, he said.

Upon transmission to the processor, the request is assigned an identification number, an entry time and a geographic zone designation based on the telephone number.

The information then moves to a spotter, whose CRT display is supplemented by a list of garages operating in the zone assigned to that service request.

By looking at the current loadings for these garages (also part of the CRT display), the spotter selects an appropriate garage, assigns the call to one of the dispatchers and releases the service request for further processing.

This sends the information to the terminal of the designated dispatcher and brings the next service request to the spotter's terminal.

The dispatcher exercises his prerogative to change or accept the assigned garage, radios the appropriate garage to dispatch the service request and releases the information to the processor, the spokesman noted.

When a garage reports the disposition of a service request to a dispatcher, he preempts the normal display on his CRT terminal, retrieves the information about the affected service request and logs the additional data.

Once this is done, the regular dispatching cycle resumes automatically, he said.

Supporting these functional units is a supervisor's CRT equipped with a wide variety of commands for monitoring all aspects of system status and performance, generating immediate summaries of system activity and modifying system operation.

Tracing Capability

One of the most effective features of Casers is its tracing capability, the spokesman noted.

When a member calls back to determine the status of his service request, the person receiving the call – probably not the same one who logged the original request – can retrieve complete information about that request merely by specifying the first two letters of the caller's last name.

In response, the system displays sufficient information about all requests with names having the same initial letters so the desired record is easily identified and retrieved.

The resulting display includes current status as well as the time for each status change, thereby allowing a full report to be given once the tracing process is completed. At that time, the CRT reverts to its regular data entry function, he added.

Supporting Features

This basic cycle of activities is supplemented by an array of supporting features.

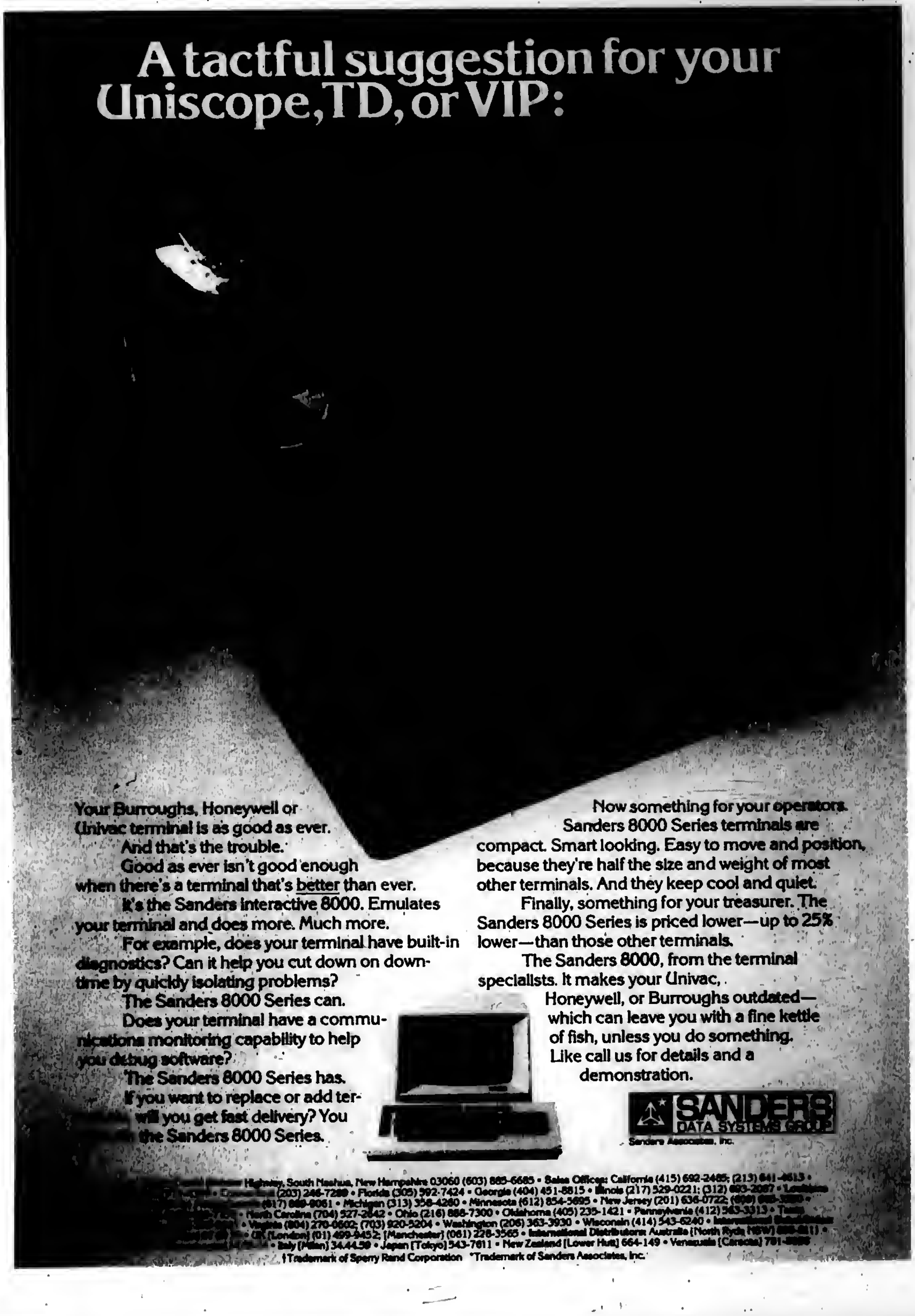
All information, including status changes, is maintained in a disk-resident file of request records and is paralleled by a printed copy, thus ensuring continued service without loss of information in case of system failure.

This was exploited one time in slightly over a year of basically continuous online operation, he noted.

In addition, at the end of each day, the system produces on magnetic tape a complete archive of the day's activities. This is transferred to microfiche for subsequent reference and follow-up work.

During the operating day, a variety of procedural conveniences function automatically on command. For example, if a service request has not undergone a status change within a prescribed time interval, that record is displayed automatically on the appropriate terminal, interrupting the normal processing/display cycle, he said.

Similarly, such interruptions may be instigated directly from the CRT in order to handle some special processing.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Codex Control System Handles Fast-Poll Modem Diagnostics

NEWTON, Mass. – Codex Corp. has introduced the Multipoint Network Control System (MNCS) which provides monitoring, diagnostic and restoral functions for Codex's Fast-Poll multipoint modems.

The MNCS is composed of two basic elements: the master control console, which provides the man-machine interface to the multipoint network, and the remote card set, an option to the Fast-Poll modems.

The master control console is capable of providing control of up to eight separate multipoint lines, each of which can have up to 30 drops for a total of 240 addressable locations, Codex said.

Supplemental Control Capability

In addition, the system can be supplemented with digital patching modules which permit patching the console into an unlimited number of additional multipoint networks, the company noted.

The MNCS identifies that portion of the network which is malfunctioning and provides the capability for restoring network operation through alternate facilities, Codex claimed.

It operates through the use of a frequency division multiplexed secondary channel so many of the MNCS functions can be performed without interruption of data on the high-speed channel, it said, adding all operations and controls are performed at the central site and no manual intervention is required at the remote multipoint drop locations.

Three Operating Modes

Three operating modes are included in the MNCS: monitor, test and configuration. In the monitor mode, the EIA interface signals and modem indicators for all remote units can be determined successively or on a selective basis.

In the test mode, the MNCS provides the capability to perform five system test functions which include placing all remote modems in the self-test modem check mode; doing an outbound bit error rate test to check the outgoing lines; placing any unit in an audio loopback mode; placing any unit in a digital loopback mode; and performing a poll test which simulates the dynamic operating modes of a multipoint network.

The configuration mode allows reconfiguration of tha network from the central site using alternate facilities, such as the dial network or standby spare modems, to maintain network operation despite failures, the company said.

MNCS Options

Options to the MNCS include a dial backup auto answer unit, which switches a remote modem automatically into a dial backup mode upon receipt of incoming dial calls; a modem substitution switch, which switches a standby modem into operation under MNCS control; and the node bypass switch, which provides operation of MNCS functions at remote locations.

Pricing for the MNCS master control console is $4,950. The remote card set option is priced at $895, the company said.

Quantity discounts are available and delivery for all items is 30 to 45 days, Codex said from 15 Riverdale Ave., Newton, Mass. 02195.

Dual-Purpose Interface Bows

BETHEL, Conn. – A coaxial cable interface unit has been introduced by Computrol Corp. for computer-to-computer and computer-to-peripheral communications at transmission rates up to 1M bit/sec.

Two or more computers can be connected to one CCI-4000 coaxial cable, Computrol said. Computer-to-peripheral connections can also be provided with the CCI-4000 by the addition of plug-in peripheral point boards, it added.

Peripherals may be intermixed and operated at different speeds.

Transmission distance can be up to 40,000 feet without repeaters. High normal mode voltages, which may exist on the cable when transmitting over long distances, do not affect data transmission, Computrol claimed.

The CCI-4000 transmits data asynchronously in half-duplex mode, although full-duplex mode can be obtained by using twin cables and two additional cards in each CCI-4000, it noted.

The standard CCI-4000 employs a parallel interface designed for standard I/O boards of most computer manufacturers. A CCI-4000 is used to connect each computer to the cable, according to the company.

The CCI-4000 includes coaxial cable modem and logic interface cards and power supply.

It is priced at $2,840 with a 120-day delivery schedule, Computrol said from Berkshire Industrial Park, Bethel, Conn. 06801.

Infotron, Timeplex Gain Honors

(Continued from Page 21)

GTE's FDM received a 3.7 in the ease of installation category; for ease of expansion, the notables were Timeplex's T-4 and T-20 devices, which each received 3.5 ratings.

Some users have more than one type of multiplexer, so the replies represented a total of 46 product ratings; a total of 220 units were reported on, Datapro noted.

About one-third of the users surveyed use the public telephone network's dial-up facilities and about two-thirds use leased lines to establish the low-speed side connections, according to the research firm.

On the output side, 25 responses indicated usage of a leased voice-grade line without identifying a carrier; six users named Bell's Dataphone Digital Service (DDS) network; one user named the now-defunct Data Transmission Co. (Datran) service; and two named Western Union.

A majority of TDM users are employing 4,800 bit/sec lines (31%) and 9,600 bit/sec lines (29%).

Common Problems

The most common problems outlined by respondents were line outages or line quality, gathering 39% of the responses, the report showed.

The survey report contains comparison charts on 46 multiplexers offered by vendors, noting the technique used (TDM or FDM); interface, code and speed intermix types; diagnostic facilities; and pricing and availability.

"All About Data Communications Multiplexers" costs $10 from Datapro at 1805 Underwood Blvd., Delran, N.J. 08075.

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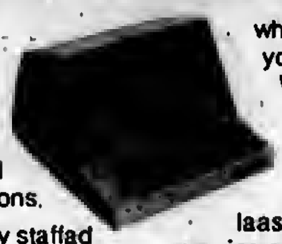

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omTEC was developed and is maintained by Computer Industries Corp., Cleveland, Ohio

Bits & Pieces

Edmac Key-to-Tape System Features Buffered Keyboard

EAST ROCHESTER, N.Y. – Edmac Associates' key-to-tape system features a buffered keyboard on a data entry terminal and cassette tape recorders.

Up to 11 characters may be entered on the keyboard; each entry is displayed prior to recording to permit verification, the firm said.

Data is recorded on cassettes in Ascii format, and up to 90,000 characters can be recorded on each cassette. The system sells for under $1,000.

While as many keyboards and cassette recorders can be added to an installation as a user needs, one playback unit can often serve them all, the vendor noted. That unit connects on-line to a dedicated mainframe, a time-shared system, a programmable calculator or a modem. It is priced at $2,350.

Both the key-to-tape system and the playback unit are available from Edmac at 333 W. Commercial St., East Rochester, N.Y. 14445.

Dysan Has Top-Loading Cartridge

SANTA CLARA, Calif. – Top-loading disk cartridges in an IBM-compatible configuration are available from Dysan Corp.

The Dysan 5440 cartridges also come in non IBM-compatible configurations, meaning they have one index and a variety of sector slots as opposed to one index with no sector slots, the vendor said.

With capacities of 2.5M bytes to 4M bytes, the cartridges are $98 each and can be obtained from the firm at 2388 Walsh Ave., Santa Clara, Calif. 95050.

Burster Has Variable Speed Control

OAKLAND, Calif. – Tion Equipment Co. has introduced a forms burster with a variable speed control feature said to allow an operator to perform a variety of functions in one operation.

The burster has a decollate feature, slit pin-feed margins and a chop margin waste option as well as an imprinting option.

Operating at over 300 ft/min, the system includes two jam detectors, dynamic breaking, a static eliminator, rollers designed to reduce carbon tracking, safety covers, adjustable tear points and a center slitter, he said.

The standard burster is priced at $3,040, the imprinter costs $450 and the chopper costs $210. Tion is located at 262 Grand Ave., Oakland, Calif. 94610.

Earnings Quadruple Since '68

System Keeps Pace With Firm's Growth

BIRMINGHAM, Ala. – Faced with unprecedented growth over the last several years, a company here has updated its DP department with an information system it hopes will match its growth pace, according to Ray Parrish, DP manager.

Alabama By-Products Co. (ABC) has quadrupled its earnings since 1968 and employment has risen from 1,000 to 2,900 people. The company was recently thrust into the ranks of *Fortune*'s Second 500.

But ABC's DP department was outdated. Operating essentially with bookkeeping machines, the firm was able to handle accounting applications, but was unable to take on additional tasks, Parrish said.

"We were just running out of steam with these machines; what we were looking for was a lot more power and capability, particularly in communications," he recalled.

The firm considered systems from IBM, Burroughs Corp., Honeywell Information Systems and Univac before choosing a Univac 90/30.

"By comparing the cost of the systems through the growth cycle, the Univac seemed to be lower in the long range," Parrish noted.

The 90/30's performance, based on a comparison of the other systems' internal power ratings, was about one and one half times greater, he added.

The company was considering small-scale models of the other companies' systems, but none offered a growth path compatible with ABC's needs, he added.

"At the time, we could have gotten 16 100M-byte disk packs for the system; now Univac offers double density, so we can even go to 16 200M packs," Parrish said.

Another factor in the selection was the applications software, which was unbundled with most of the systems but still bundled on the Univac. That made a difference of about $1,000/mo, Parrish said.

ABC's Operations

ABC's oven plant at Tarrant City, Ala., produces about 800,000 tons of coke annually.

The company also operates six large underground coal mines in Alabama, the newest of which is expected to reach full capacity in late 1976, and one surface coal mine. Coal production was in excess of four million tons in 1975.

ABC's payroll DP operation encompasses three main payrolls – a biweekly covering 2,300 miners, a weekly for 400 employees at the Tarrant plant and a monthly for salaried personnel.

Alabama By-Products Co., one of *Fortune's* Second 500, has updated its DP operations.

The payroll operation is a complicated application, Parrish said, explaining the computer runs 11 different payrolls – each unique to a particular facility.

"We have to cope with just about every type of situation that can be encountered in a payroll," Parrish said. "For example, our miners could be working under five or six rates of pay in one day."

Time abstracts for the miners and plant employees are received in the DP department, keypunched and then entered into the system. In the near future, ABC hopes to reduce much of the paperwork involved in this operation by transmitting pertinent information from the mines and plant directly into the system via remote key-to-disk or key-to-tape terminals, according to Parrish.

Another of ABC's plans is to "marry" the personnel data base to the payroll, he noted.

"We will have work-history records on which we can capture information on any changes and obtain data on an employee's new status immediately after he is transferred from one workstation to another," Parrish said.

Information in the personnel data base will be accessed by keying in either the employee's Social Security, payroll or employee number.

ABC will use Univac's IMS/90 software to facilitate retrieval and updating of information in the personnel data base.

Soon, the firm plans to install terminals for authorized personnel department staff to access information in the computer's data base, Parrish said.

One section of the personnel data base will be reserved for storing information on persons applying for employment.

When a change occurs in an employee's status or other data, the personnel data base will be updated and a "flag" will be set. A listing of all new changes will be made and a master sheet prepared for the personnel department on a monthly basis, he said.

The computer will also produce individual employee record forms which can be run weekly or monthly as needed on an exception basis to reflect changes in the employee's data since the last run.

The present preventive maintenance program will be expanded into a full maintenance reporting system covering the company's mines as well as the plant.

Presently, work order schedules are produced by the computer weekly for various departments at the Tarrant City plant. These schedules are produced on the computer immediately prior to the week when the work is scheduled, Parrish noted.

Executives See Tie Between DP, Profitability Getting Stronger

CHICAGO – DP and financial executives believe data processing will be more important to their organizations' profitability in the next five years than ever before, according to a survey conducted by Peat, Marwick, Mitchell & Co.

But the more than 147 corporate presidents, financial vice-presidents, controllers and heads of DP departments surveyed indicated their data center users are not satisfied with present service levels.

One out of four of the executives said they have attempted to measure the return of their DP investment, but fewer than one out of three are satisfied with that return.

Only 30% of the survey participants said top management rates the performance of their organizations' data centers on quantified measures of performance. This could be changing, however, since more than one-third indicated their organizations have a plan to improve data center performance, the survey noted.

About half have some form of computer performance evaluation (CPE) effort planned or under way, the survey found. About one-quarter of the participants said their computer vendors encouraged them to establish a continuing CPE effort.

The survey was conducted at a seminar sponsored by Peat, Marwick, Mitchell's Chicago office. Organizations represented were financial institutions, manufacturers, government and nonprofit groups. The firm can be reached at 222 South Riverside Plaza, Chicago, Ill. 60606.

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☐ NUMERIC ☐ HAND PRINT ☐ OTHER
SPECIFIC FONTS ______
☐ TYPEWRITER ☐ PRINTER ☐ EMBOSSER

[illegible] information
systems, you'll [illegible]

Your company's data processing requirements are as unique as your company's trademark. You need an information system designed exclusively for you—not for the other firm. This means a wide range of high performance products to select from, a knowledgeable staff of representatives to make the ideal recommendations. There must be value, versatility, and the finest service. That means Mohawk Data Sciences. In data entry and data communication equipment, we help you make the intelligent Choice.

Every MDS product is designed to be the best of its kind. Our equipment is engineered to maximize support capabilities (and manpower capabilities) while minimizing mainframe work load. The MDS Intelligent System, a prime force in distributed data processing, makes [illegible] ods for the pr[illegible] tion of informatio[illegible] technological re[illegible] unparalleled sco[illegible] major corporations around the world.

Post-installation service must be a consideration of any company evaluating new equipment. MDS is synonymous with the highest standards of product service. Our 4000 plus associates worldwide insure that the highest caliber of performance is built into our equipment—the performance you can depend on in your offices.

Solid business solutions can emerge only from facts. Hard-hitting, solution-oriented facts—precisely what you'll receive from your local MDS office. Call or write us soon. We make the intelligent Choice an easy one.

[illegible] Data Sciences
The Intelligent Choice.

[illegible]. The System 2300 is an intelligent terminal offering computer-[illegible] data capture, simultaneous with [illegible] Processing at the source. The [illegible] is also capable of RJE Com[illegible]

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Markham, Ontario
(416) 495-6060

MDS INTERNATIONAL SERVICE CORP.
Rue Ducale 53
1000 Brussels, Belgium
(02) 513-48-43

Intel Has Add-On for PDP-11/70

SUNNYVALE, Calif. – The In-1670 from Intel Memory Systems offers 4M bytes of add-on memory for the Digital Equipment Corp. PDP-11/70 in the same space required by that system's own memory, Intel said.

A complete system with memory cards, chassis, power supply, cooling fans and controller can be installed directly into the PDP-11/70 memory cabinet without modification, the firm said.

The memory includes error-correction checking and error-logging features and is said to correct all single-bit failures. Double-bit failures are recorded in hardware registers for later examination during maintenance service, Intel said.

All voltages, currents, timing and I/O signals are 11/70-compatible, the vendor claimed. The memory can be expanded in increments of 128K bytes and features a 750 nsec cycle time with a 550 nsec access time, the firm noted.

The cost of 128K bytes of memory is $13,000; 1M byte costs $52,500. Intel is at 1302 North Mathilda Ave., Sunnyvale, Calif. 94086.

$1 Million Inventory Cut Credited to Minicomputer

By Esther Surden
Of the CW Staff

ALLENTOWN, Wis. – A minicomputer credited with reducing inventory by $1 million since its installation has been keeping tabs on everything from customer order entry to shipping, the user said.

Maysteel Corp. is a sheet metal fabricator specializing in close-tolerance custom cabinetry for automatic data systems, appliances and office equipment. It processes approximately 1,000 jobs at one time in its plant here.

Each job has an average of 10 component parts and six operations per component, totaling about 10,000 components requiring materials costing and 60,000 operations requiring labor and overhead costing.

When the firm decided it needed to computerize, it investigated time-sharing with another firm in the same business. After it got started and established an implementation team to define what it wanted to do, however, "we decided that trying to time-share with another company was never going to be sufficient for us," according to Lewis Eytchison, vice-president of materials and information system.

At that time the company looked at both Honeywell and IBM systems. The Honeywell system was not installed in any working applications, and the firm's consultants, former IBM people, informed the company that conversion to a Honeywell system would be expensive and take more time than conversion to IBM, Eytchison said. The company then purchased an IBM 3/10.

The company has since upgraded in a variety of steps to a 3/15 with 256K and then 180M bytes of storage. Cardless for about a year, the firm will soon upgrade to 5M bytes of storage, Eytchison said.

The configuration at Maysteel includes the Model 15 with three printers and eight CRTs, two of which are remotely located, and IBM 3741 diskette recorders, he said.

The system, including hardware, software, consulting fees and employees' salaries, has cost the firm over $500,000 over the past four years, he added.

Well Defined System

The reason the firm's system works as well as it does is because the data base is clearly defined, he said. This he credited to the consultants who did the major programming for the system, MRM, Inc., a Milwaukee firm.

Maysteel's data base covers information on almost every aspect of the firm's business. Customer information includes sales orders, purchase orders, customer parts numbers and the master schedule.

Information on the manufacturing process includes an engineering part master, bill of materials, routing, work center program, tool bill and tool master, as well as manufacturing orders and open purchase orders.

The system also keeps track of component materials requirements, labor in

(Continued on Page 32)

Processing Time Slashed

Warehouser Likes the Way Mini Stores Orders

LOS ANGELES – A minicomputer system at a public warehouse firm here has cut order-processing time from several hours to less than 10 minutes and increased billing accuracy with a resulting improved cash flow, the user said.

U.S. Growers Cold Storage's customers are primarily food brokers who order various commodities in volume and store them in public warehouses. When the brokers receive orders from restaurants, fast-food chains and other retail outlets, they phone U.S. Growers and specify product, quantity and delivery information.

The firm's revenue stems from warehouse charges, handling and special processing, according to Jerry Monroe, the firm's DP manager.

Clerks record 400 to 500 types of incoming inventory each week, storing lot number, quantity and location on disks attached to a Digital Equipment Corp. Datasystem 500. The system keeps records of the more than 10,000 pallets of commodities stored by 500 active customers.

Records Once Outdated

Before U.S. Growers installed the mini system, inventory, accounting and order processing were basically manual operations supported by an outside service bureau. Records and receiving documents were batched and transmitted daily using a remote job entry system.

The service produced lot listings and sent them by messenger to U.S. Growers. Because of the time involved, the records were one to three days out of date.

Incoming orders were manually checked against monthly, weekly and daily listings before preparing the shipping documents and sending them to the warehouse for delivery.

The Datasystem 500 configuration consists of a PDP-11/45 CPU with 80K words of core memory, one RP04 disk, a TU16 tape drive and a 1,200 line/min printer. Input is through six on-line CRT terminals with printing terminals providing hard-copy output for each of the five warehouses.

All application software was written in Basic Plus and operates under DEC's CTS-500 commercial transaction executive.

U.S. Growers examined a number of on-line systems including those from Basic/Four Corp., DEC, General Automation, IBM, NCR, Singer and Qantel. After about a year of analysis, it finally decided upon the DEC Datasystem 500.

The alternatives were ruled out one by one, Monroe noted. IBM and NCR were eliminated from consideration because their prices were about $150,000 more than the company wanted to spend, he said.

Qantel's system didn't seem to have the necessary capabilities and the Basic/Four unit could only support four terminals; General Automation was "just coming out with the necessary software, and we didn't want to be a guinea pig"; and Singer was on its way out of business.

Operating since last October, the system has cleared up ambiguities inherent in the previous batch method. Clerks process telephone orders directly using on-line CRT terminals. When a broker calls, a clerk keys in a lot code number, quantity and delivery information.

The system immediately compares the order with the broker's stock listings resident on disk and confirms the quantity can be shipped.

In the past, Monroe said, there was a high likelihood the clerk would miss an entry in the five books of listings or the individual daily receiving and shipping tickets. Now, if the broker orders 55 cases from a lot containing 50 cases, the program prevents the order from being sent to the warehouse and informs the clerk.

(Continued on Page 32)

U.S. Growers' order entry center handles 300 orders per day.

Tap us for terminals.
There's one for every need.

GE TermiNet 30* — 30 cps
Mag tape send-receive matrix printer. Speed and flexibility on a day-to-day basis. ($90-$145 per month, depending on model selected, on a 1-yr. lease, including maintenance.)

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Model 33ASR with dial-up set. ($90 per month on a 1-year lease, including maintenance.)

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First we track down the problem.

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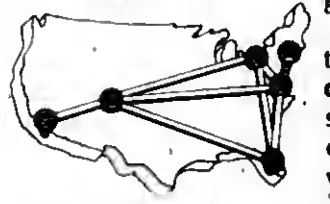
Four problem-solving options are yours with Martin Marietta Data Systems' On-Site Remote Job Entry Computing Service.

1. RJE . . . as a **Supplement** to current facilities

Through our Nationwide Network, you can supplement your existing computer by plugging into the **virtually limitless configuration**, infinite capacity and state-of-the-art technology of our 370/168's. Simply install a Remote Job Entry Terminal in your offices—or those of a remote subsidiary—and the power of the /168's (16 meg with VS, TSO, IMS, CRJE) is immediately available.

You'll save money compared with upgrading or replacing your existing machines—especially if it's well written down. **You pay** *only* **for what is used**; avoiding the quantum "step" costs associated with upgrades. Your loads can grow until upgrades are fully justifiable.

NATIONWIDE NETWORK



On our Nationwide Network (as with the central hardware and software) **economies of scale and utilization apply** offering substantial savings on the cost of communication equipment, associated central software and attendant network management.

eg: Network Management Supplements Capacity

PROBLEM: "We need to service a remote location, but we must carefully evaluate the costs and support required to enhance our existing facilities. What are our options?"

SOLUTION: This massive oil company with twin IBM 370/168 processors (with plenty of computing power left) in a centralized environment is now servicing a remote location through MMDS' **Networked RJE Computing Power.** An imaginative approach from MMDS proved more cost effective than expanding their existing communications network.

By leasing one shift of an existing terminal facility, they received immediate benefits:

Testing	Shakedown of terminals, lines and modems not required.
Reliability	Redundancy (routing/lines) already built into MMDS' Network. Cost prohibitive if on their own.
Timeliness	Conversion, security procedures and systems set-up by MMDS' specialists—per requirements.

Had they expanded their existing network, they would have absorbed 100% of the following costs:

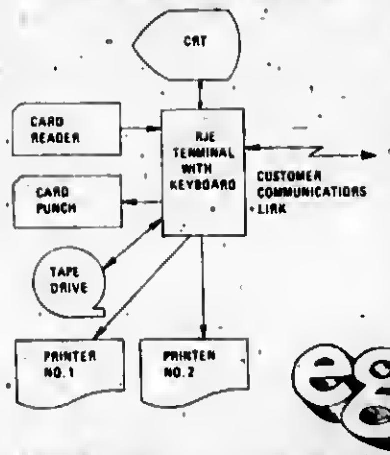
Terminal	$1,886/month
Dedicated Line	1,760/month
Modems	500/month

While spending only a third of the dollars they, more importantly, share in the economies of scale and utilization of the MMDS Network. Elimination of associated network management tasks was more than welcome.

2. RJE . . . as a **Replacement** for an existing facility

Using MMDS's Remote Job Entry Computing Power is **as convenient as running your own machine**. It's cheaper (10%–30% typically) and more versatile. Responsive to either growth or reduction in usage, you always work at 100% utilization: paying only for what is used.

EXAMPLE: RJE CONFIGURATION



On-site card readers, video terminals and printers are handled the same as those on an in-house computer. You test programs and run your systems exactly as on your own machine. **Operational control is unchanged,** except that mainframe tasks are handled by the MMDS "Host" Computing Center. Because of this difference you get: contemporary hardware/software, networked computing power, daily configuration flexibility and free access to MMDS' methodologies and tools.

eg: Manufacturer Replaces 370/135

PROBLEM: "Our remote locations need information distributed on a more timely basis. What additional hardware (local and remote), software and technical capability should we add? What are the costs?"

SOLUTION: Without increasing costs, this medium sized DOS user immediately satisfied his total requirements. He's now utilizing the latest in hardware and software without having incurred the in-house expense associated with implementing such enhancements. Tapping MMDS's **expertise in mini-computers and communications networking**, he installed a distributive data processing network. This distributive network allows placement of critical information at remote sites in a matter of minutes, not days.

MMDS's Networked RJE Computing Power is compared with this user's prior costs. Included are the costs of their distributive network—a Datapoint 2200 and two 1100s. With no change in overall costs, he's expanded his service and added new systems: he's using our off-the-shelf Modular Application Systems (MAS)—free through RJE.

	BEFORE MMDS	WITH MMDS	$ SAVINGS
Hardware*	$19,000/Mo.	$ 1,050/Mo.	$17,950/Mo.
Personnel	10,000	7,300	2,700
Supplies	2,500	2,200	300
Miscellaneous	550	120	430
Processing	-0-	14,000	(14,000)
Communications	-0-	600	(600)
New Hardware**	-0-	3,000	(3,000)
TOTAL	$32,050/Mo.	$28,270/Mo.	$ 3,780/Mo.

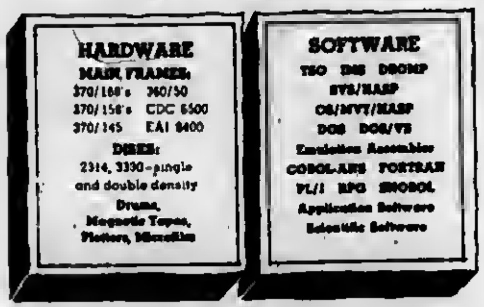
*In-house computer and related unit record equipment
**Terminals and minis

3. RJE . . . as an **Alternative** to acquiring a new computer

Instead of installing a small computer, consider **RJE Terminal Computing as an alternative**. You get your own card reader, printer and video displays; and you **use the terminal as you would your own machine.**

There the similarity ends. You avoid all the constraints of small computers: gaining speed, facilities, capacity, programming languages, off-the-shelf system libraries and flexibility. **You keep your options open**; while escaping the tyranny of machine amortization and the forcing of systems and installation schedules.

CAPABILITIES SNAPSHOT



Above all, from MMDS, you get business systems expertise and data processing discipline. With no cost for our *Systems Development Methodology* and free systems and programming tools, we pass on the *attitudes* and *disciplines* of successful computer/systems usage.

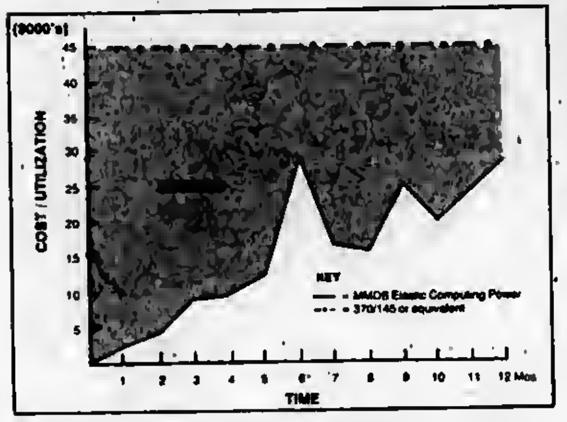
eg: State Agency Saves 50% in One Year

Problem: "Budget is not our problem! To implement our new system, we must accurately predict the eventual computer power and utilization requirements . . . as well, growth rate."

Solution: To implement their sophisticated "Road Design System," the agency considered acquisition of its own computer. A 370/145, or equivalent, was their best estimate. At $45K/month, all up cost, this would likely suffice for 2–3 years. At the same time, they recognized:

- in the short term, they'd have an under utilized machine (but continued upgrade would be a headache);
- a missed projection could be an expensive error.

MMDS is now supplying them **"elastic" computing power through an RJE Terminal**. In one year, RJE Computing Power helped them build experience with their system, determine their level of utilization and save over $300K, plus associated opportunity costs.



If the agency should elect to go to an in-house computer, its risks are now minimized.

. . . and the Technology to Support You

Using MMDS' RJE Computing Power gives you facilities, software and flexibility. Running the terminal is almost exactly like running your own machine. But the data processing expertise and disciplines that round out the package provide further payoffs. For example:

FREELY AVAILABLE TOOLS

- Systems Development Methodology (SDM)
- Data Specification Language (HSL)
- Decision Table Processor (Tablemaster)
- Modular Programming Test Harness (Testmaster)
- Off-the-shelf Modular Application Systems (MAS)
- Modular In-House Training System (MITS)

Productivity Aids

With over 50 technical specialists and large-scale equipment, we provide a complex VS, TSO, IMS, CRJE environment. This, with the compilers and utilities we offer, gives you a lot of power. We make sure that the system is fully up-to-date and exercised. On top of that, we make available—at no cost—our proprietary **methodology and tools.**

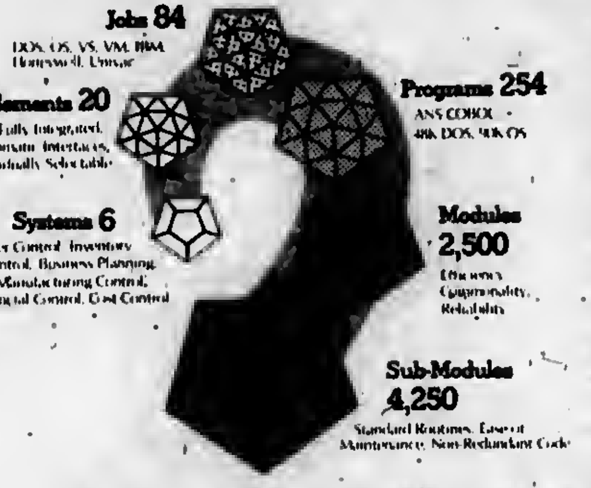
MMDS Conversion Program

Operating as TSO commands, these programs produce a mixed conversion to OS and/or DOS simulation under OS—from DOS or other operating systems. The accompanying chart shows the conversion strategy used by these programs as a function of original program type:

ORIGINAL SYSTEM	METHOD OF CONVERSION	RESULTING OS SYSTEM	PCT. OF JOB AUTOMATICALLY CONVERTIBLE
COBOL DOS/D	MMDS Conversion Programs	OS ANS COBOL	[redacted]
ANS/DOS COBOL	MMDS Conversion Programs	OS ANS COBOL	[redacted]
RPG I	MMDS Conversion Programs	OS RPG I	[redacted]
RPG II DOS SYSTEM 3	DOS Simulator	DOS RPG II Under Simulator	[redacted]
DBOMP	DOS Simulator	DOS DBOMP Under Simulator	[redacted]
BOMP	DOS Simulator	DOS BOMP Under Simulator	[redacted]
FORTRAN—Any	MMDS Conversion Programs	OS FORTRAN	[redacted]
DOS ASSEMBLER	MMDS Conversion Programs	OS ASSEMBLER Under Simulator	[redacted]
DOS JCL	MMDS Conversion Programs	OS JCL	[redacted]

4. RJE . . . as a **Conduit** for off-the-shelf MAS

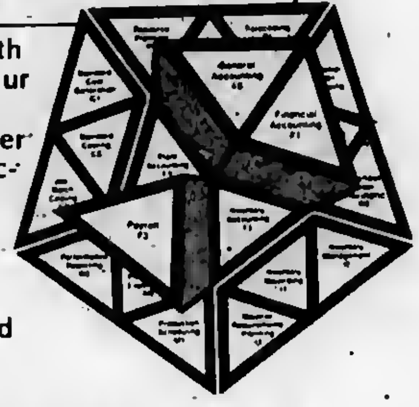
If you're concerned with systems as well as computer power, MAS through our RJE service provides access to over **340,000 lines of code at no cost**—with single supplier dedicated system convenience. You pay only for set-up and customizing you elect to have done.


Jobs 84
DOS, OS, VS, VM, IBM, Honeywell, Univac
Elements 20
Fully Integrated, Automatic Interfaces, Individually Selectable
Systems 6
Order Control, Inventory Control, Business Planning, Manufacturing Control, Financial Control, Cost Control
Programs 254
ANS COBOL 48K DOS, 50K OS
Modules 2,500
Efficiency, Commonality, Reliability
Sub-Modules 4,250
Standard Routines, Ease of Maintenance, Non-Redundant Code

Our "Modular Application Systems" (MAS) are a range of business application modules. They can be run on your own computer, or on our nationwide computer power network (MAS on RJE). The distinctive structuring permits simple tailoring of the systems to your exact specification.

Use a module, a program, a job, a system or a selection of systems. Install them in any sequence, in a standard or customized form, and they'll link together to provide a completely integrated system that **fits you now and as your business needs change.**

eg: MAS on RJE Provides Immediate Financial Control



Problem: "We're projecting a 30% growth rate and need more timely processing of our financial data. We're also planning to add inventory and customer and purchase order processing systems. What's our most effective approach?"

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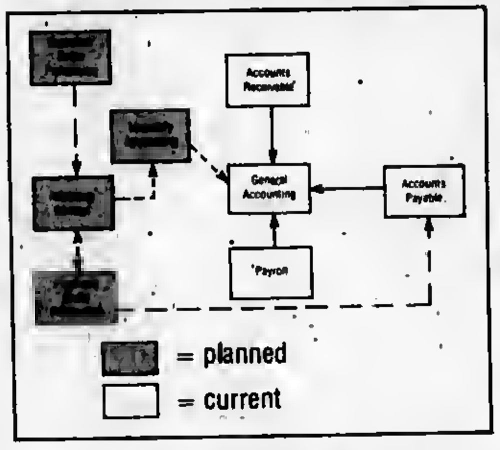

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We Build & Run Systems

By Improving Inventory Control

Mini System Puts Dealer's Dollars in Right Products

BURBANK, Calif. – To make sure "the dollars on the shelf were in the right products at the right time," a distributor here switched from a manual office operation to a small business system.

"As distributors of both industrial and fluid power product lines, our two most important concerns are inventory control and sales performance," according to William Baribault, president of Elec Air Tool Co., Inc.

"In order to get the kinds of in-depth reports required to analyze the movement of products through the warehouse, as well as the necessary sales figures to determine profitability, we realized that computerizing was the best approach," he added.

Baribault spent two years looking at hardware and visited nearly 50 user sites with equipment from eight manufacturers before deciding on a Basic/Four Corp. system.

"Every computer installation that was successful had good preparation and documentation completed prior to the system's arrival. I saw good hardware that people were disillusioned with, but it was not the hardware's fault," he said.

Smooth Transition

Elec Air Tool made the transistion to the Basic/Four system smoothly because the firm knew exactly what it wanted to do before it had the hardware on the floor, Baribault said.

"We reviewed the specifications over and over again and then went to a third party and had it design the software package," he explained.

"Everyone in our organization participated in developing the specifications for the system. This helped alleviate a lot of apprehension because our employees knew exactly what we were getting into.

"We felt it was very important that the people who had to deal with the system should have equipment that was responsive to their needs, rather than making our staff comply with the computer," he said.

In August 1974, Elec Air Tool installed a Model 400 consisting of a CPU, two disk drives, two CRTs for I/O and one medium-speed printer.

Operations Expanded

By October 1975, the firm's operation was expanded to include a northern California affiliate, so the company upgraded to a more powerful Model 600 with three CRTs and a faster printer. This represented an investment of about $100,000 in hardware and software.

"The success of the first model convinced us of the advantages to automation from an efficiency standpoint. Equally important, however, it showed an 11-month return on investment," Baribault said.

One of the system's major benefits is the capability to spot product trends, he noted. "For the first time, we can add products to our inventory when they are ready to sell. With our manual office operation, it was extremely difficult to identify new products that should be in inventory."

Benefits to Customers

The benefits of the system are spilling over to the customers with the help of a report Elec Air Tool developed for its customers that permits more efficient purchases. The report tells them what items they have been buying over a certain period, what the usage level has been by the month, how many times they bought a certain product and the latest unit cost.

Inventory Control

Inventory investment and control has also been improved. As an example, Baribault cited the case of one product that changed prices four times in 12 months.

"Keeping manufacturers' price books current in today's economy can be a real problem. But now, by using the mini the data is updated when a price change occurs. Then we can print out a new price list, so our sales force has the security of knowing it's selling at the proper price."

It was this kind of flexibility that caused Elec Air Tool to decide on the Basic/Four model:

(Continued on Page 34)

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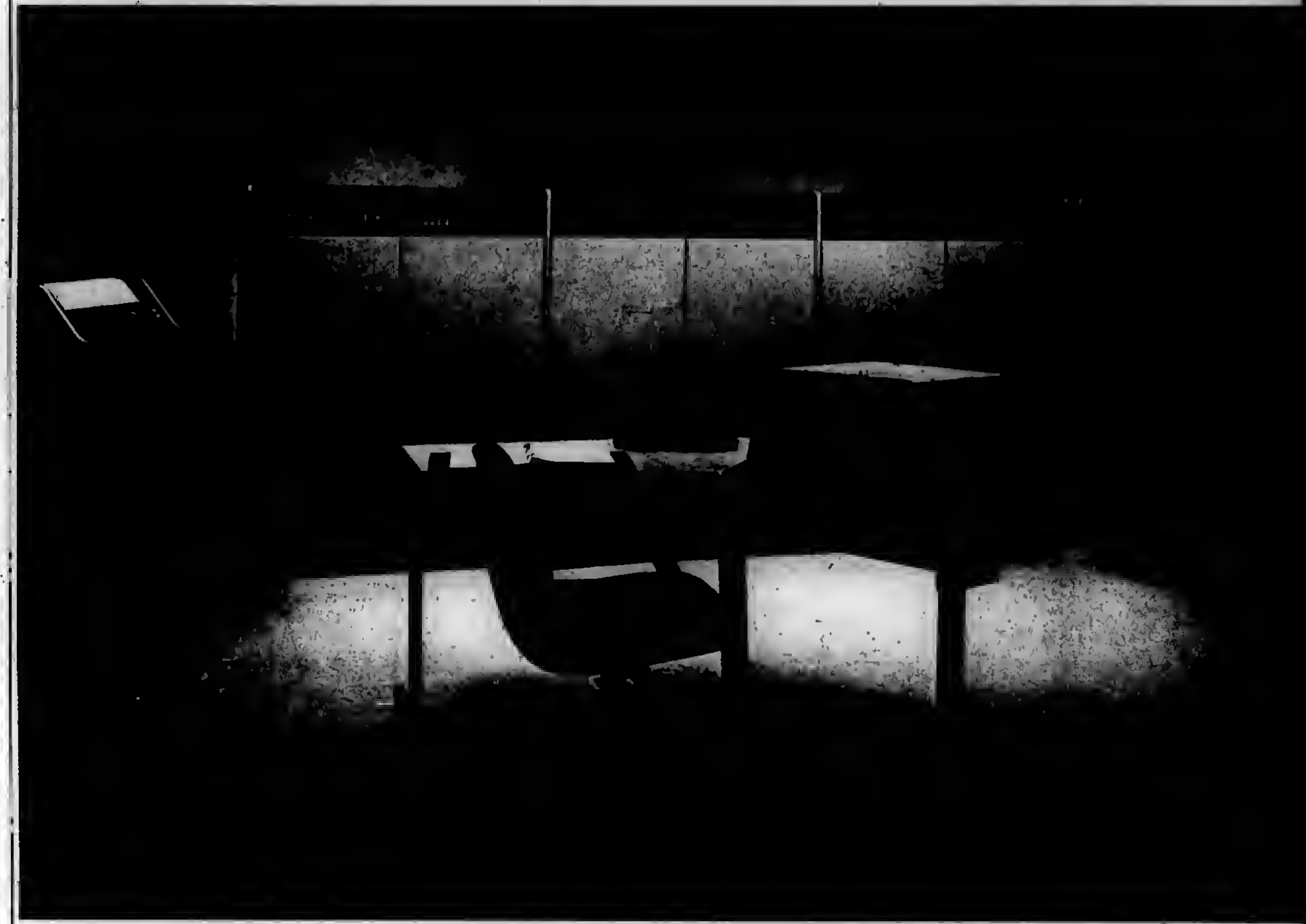

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It took a minicomputer company to offer hardware this economical.

Not just anybody could have come out with a DECSYSTEM-20.

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And that means the company that came up with it had to have a lot of experience in both big and small computers. And there is only one company that does.

Digital Equipment Corporation.

To create a DECSYSTEM-20, we took the same approach to computing that's made us the number one company in minicomputers.

That approach says that a computer must first of all be affordable– giving you the most popular computer for the least amount of money.

With the DECSYSTEM-20; this approach meant giving you big system capability at a total system cost of under $10,000 a month.

Our approach to minicomputers also said that a computer must be approachable. Meaning easy to install. Easy to use. And small in size.

With the DECSYSTEM-20, this approach meant giving you a full-scale general purpose system that installs like a dedicated mini. A sophisticated machine that needs no operating staff and can be run interactively by just about anyone. All in a package that takes up about a fraction of the space required by other machines of similar performance.

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That approach says a computer should offer you the kind of powerful software that will give you not simply everything you expect in a big system, but everything you need.

With the DECSYSTEM-20 this

Real-Time System Pinpoints Manufacturing Problems

BALTIMORE – A time-shared, real-time minicomputer system is being used to locate the source of potential manufacturing problems at a Western Electric plant here.

The minicomputer system analyzes test results, performs trend analyses and correlates problems, singling out which particular raw materials, processes, personnel or specific equipment is the cause of an out-of-tolerance condition.

According to engineers at the Baltimore Works plant, the minicomputer also produces measures of overall shop efficiency.

"It provides a picture of production quality during a given period of time and identifies problem sources. For example, we might discover, and quickly, that under certain conditions a particular problem is traceable to a particular machine line, a certain combination of operating conditions or even a particular materials supplier," a spokesman explained.

This plant is also using the mini to generate numerical control (NC) tapes used in testing telephone cords and loop distribution apparatus, evaluate the performance of production groups and perform general engineering analyses, such as simulating production processes to arrive at realistic wage incentives.

The plan processes four jobs on the system concurrently and as many as 10 users work with the minicomputer, a Hewlett-Packard (HP) 3000.

There are 18 terminals located throughout the 168-acre plant site. All the terminals operate on a dial-up basis except two which are hard-wired to the system.

The Baltimore Works cable shop produces exchange cable and coaxial cable as well as smaller quantities of toll cable and PVC stub cable.

In addition to the many process inspection tests that are performed during the various cable manufacturing operations, a number of tests are made on complete cables to ensure the cables meet exacting electrical specifications.

Most of these tests are performed on minicomputer-controlled test sets which produce hard-copy output and/or punched paper tape output. The punched paper tapes are then read into the HP 3000 as input to various programs which edit the data and store pertinent parts on magnetic tape files.

These magnetic tape files contain data on more than 10,000 individual cables and allow engineers to analyze the data.

Comparisons can be made for particular parameters between different types of cable or between different manufacturing processes.

System Produces Tapes

Another use of the system is in producing the NC punched paper tapes that contain the programmed instructions used for running tests of telephone cords. Test engineers have programmed the system in Basic, allowing technicians to enter cord specifications. The computer then generates the NC tapes on a 75 char./sec HP paper tape punch.

This tape is placed on a read-only memory controller that stores the test information into the test set. The operator then hangs up the cords, which may contain 100 to 400 wires, on a test rig, plugs them into the test set fittings and tests hundreds of different types, designs, colors and lengths of cord for continuity, correct sequencing and voltage breakdown.

DCT Has Desktop Units For Small Businesses

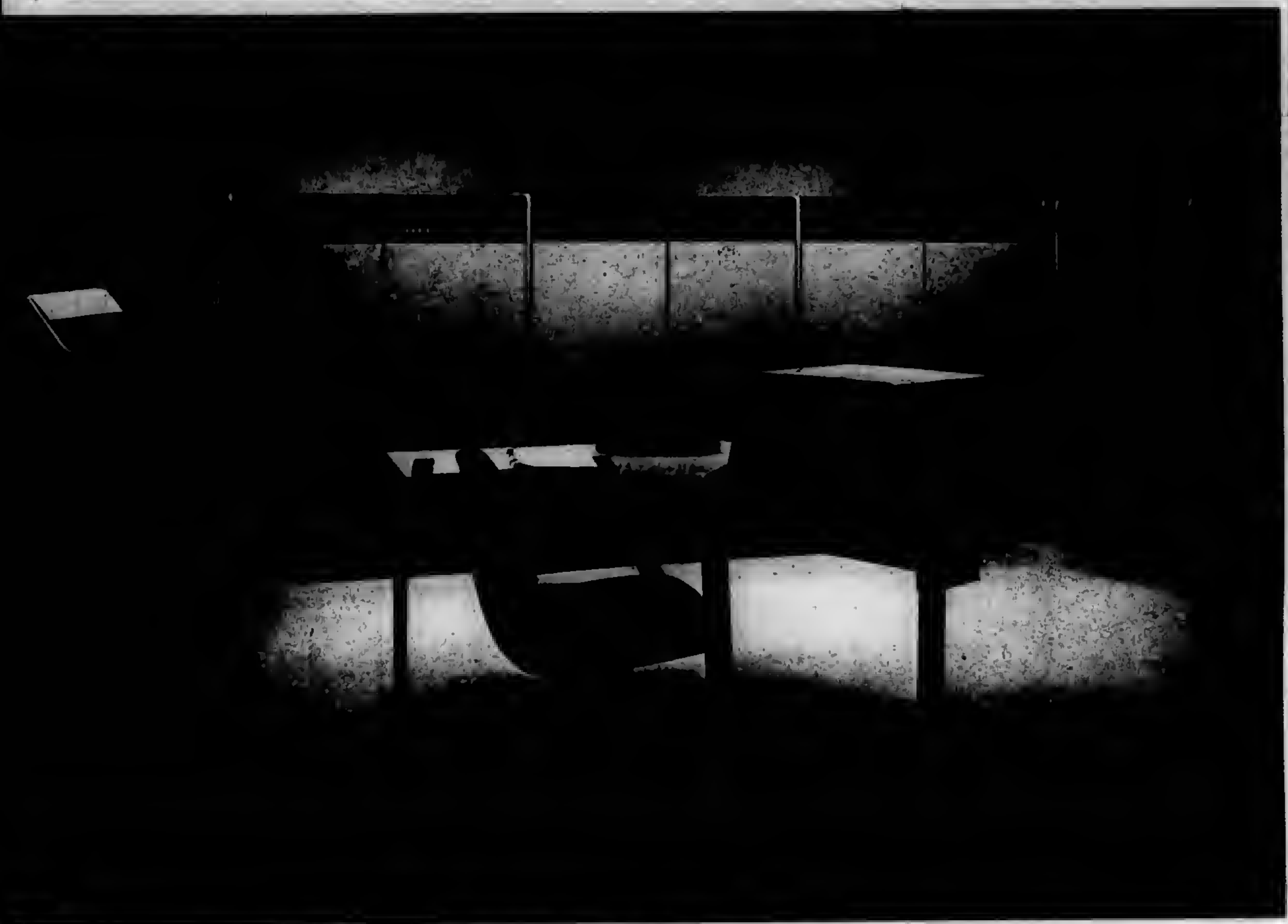
CAMPBELL, Calif. – Designed for small business users, the Micro File MK 11 and MK IV microprocessor-based desktop computer systems are stand-alone systems with floppy disk storage, according to the vendor, Data Terminals and Communications (DTC).

The MK 11 has one dual-disk drive while the MK IV handles two of the drives.

Each system has two RS-232 serial I/O ports that can handle both data terminal and other data communications lines operating at up to 9,600 bit/sec.

User memory is 8K bytes of random-access memory expandable to 56K bytes, the firm said.

The MK 11 costs $4,295 for a basic system while the MK IV costs $6,750, the company said from 1190 Dell Ave., Campbell, Calif. 95008.



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PRINCIPAL/LINE INQUIRIES WELCOME

Mini Helps Vienna's Air Controllers Handle Traffic

VIENNA, Austria – A minicomputer here is helping this city's air controllers handle their congested flight docket. The system, operating around-the-clock, coordinates the air traffic control system.

The basic data for the Control Data Corp. System 17 is a file of repetitive flight plans, stored off-line and brought up for display at the commencement of a flight.

This information, often unchanged for several months, can be amended at any time by air traffic service messages. These include new flight plans, new arrival or departure times or other modifications to filed plans that are sent to the computer from outlying points in the Aeronautical Fixed Telecommunication Network.

System Checks Accuracy

Messages are prepared according to International Civil Aviation Organization standards and are checked for accuracy by the system as soon as they are received. Acceptable messages are processed immediately; those containing errors are routed to an editing and message correction display terminal. Changes are made and the messages are then returned to the mini for processing.

The Vienna air traffic control system uses CRT terminals as the dialogue units for all application-related transactions. A flight plan in the data base is activated when an "estimate" message is sent to the mini from a terminal.

This message projects the times at which an aircraft will fly over certain navigational aids, describes the flight plan route and includes the aircraft's current altitude and speed.

New information combined with data previously stored then enables the computer to prepare flight strips and flight-progress strips which are directed to the appropriate air control sectors.

As long as strips have not been printed, revisions to estimates can be made at any time by inserting new data at the CRT consoles.

In this way, air traffic controllers at the Vienna center can have immediately available the status of all flights under their jurisdiction as an aid in maintaining an orderly flow of traffic and preventing the possibility of aircraft collisions.

From there, local climatic conditions can be entered into the system via terminal as the computer calculates estimated flying times between reporting points.

In order to keep the "bays" of flight progress boards from being overloaded, flight strips are held in the system's memory until the air traffic controllers need them for coordinating aircraft patterns.

Mini Saves Warehouser's Time

(Continued from Page 27)

The clerk can then call up historical records of commodities in storage, receiving documents and previous shipments from various lots. With this data, the clerk can discuss discrepancies while the broker is on the telephone.

Once the quantities are verified, the program processes the order and prepares a picking slip which is remotely printed by a terminal in the appropriate warehouse. Time from order receipt to picking slip is less than 10 minutes, Monroe said. Once the lot is shipped, a confirmation notice is printed.

For even faster service, U.S. Growers has installed terminals in the offices of several large customers. The customers can enter their own orders and review their inventory status directly.

An important cost factor in warehousing is wooden pallets and separators. Boxed products arriving at the docks are placed on pallets using appropriate separators between each layer to ensure air convection for proper cooling.

These pallets and separators belong to U.S. Growers; the exact quantities are noted on the receiving tickets and become part of the lot record. If the pallets and separators are shipped with the lot and not returned within 30 days, they are automatically charged against the customer's account.

The value of this wood is significant in an operation of this size; $4,000 to $5,000 worth of pallets and separators cross the docks each week and "with the system we know precisely whose and where they are," Monroe said.

An essential part of the firm's changeover from the service bureau to in-house computer operations was a series of computer programs Monroe developed for U.S. Growers. These interactive programs bring order processing, pallet and separator accounting, inventory control and accounts receivable into an integrated warehouse DP system.

Despite a threefold increase in commodities stored, the warehouse firm has cut its DP budget since the system's acquisition, Monroe said.

The total monthly budget, including personnel, is $4,800, the same as the previous service bureau fee alone. The system is on a lease/pay-out plan which amortizes the equipment over five years, providing follow-on economies.

System Gets Credit For Cutting Inventory

(Continued from Page 27)

process, vendors and accounts payable and receivable.

The company has reduced its inventory by $1 million and at the same time doubled its materials usage, Eytchison said.

This has been accomplished through the use of a materials requirements planning system that allows the company to project all materials by quantity. It tells the firm when materials should be ordered, thereby eliminating the guessing.

Another benefit of the system has been better customer service through timely deliveries, Eytchison said. The priority dispatch system has enabled the company to increase its capacity by about 45%, he noted.

"Before we put in the system, we would release jobs and try to build based on all the components that went into a job.

"But the priority dispatch system schedules each component part to an end product," he said.

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3M COMPANY

Mini Interfaces to Moving-Head Disk

BURLINGTON, Mass. – Xylogic OEM Components Group, Inc. has introduced an OEM system based on the Digital Equipment Corp. LSI-11 mincomputer which is interfaced to a moving-head disk.

Designed for small business systems requiring more capacity than a floppy disk, the system utilizes the Phoenix 45 disk controller, a spokesman said.

The unit operates under the RT-11 operating system. It can accommodate up to 20M bytes of disk, four terminals, a line printer and a 28K-word processor, he added.

A Phoenix 145 system with a 5M-byte disk drive, but without the LSI-11 mini or memory, costs $12,650 from the firm at 42 Third Ave., Burlington, Mass. 01803.

Cement Plant Mixes Savings With Process Control System

MISSISSAUGA, Ont. – A minicomputer-based process controt system has enabled a cement plant here to save time and money, according to the user.

The St. Lawrence Cement plant began using a process computer in 1972. The purpose at that time was to maintain stable kiln conditions, a spokesman said.

That is still the key function of the plant's Data General Corp. (DG) Nova system, but its role has been expanded into peak power monitoring, kiln bypass system controt and limited control of raw grinding, according to the spokesman.

The most significant improvements have been in kiln operations, he noted.

More exacting control by the system has contributed to an annual kiln production increase of 13% and a 5% yearly savings in fuel consumption. More efficient operations have allowed a 2-1/2% increase in kiln utilization, he added.

Kiln Controt

The multivariable control system for the kiln uses a building block approach with three interrelated loops for kiln fuel control, kiln speed control and preheater temperature control. These loops in turn depend on dozens of other variables in each section of the kiln.

The fill-in-the-blanks type of control package was written using DG's Fortran IV to let process engineers vary the structure and extent of controt functions, the spokesman said.

Continuous changes in conditions make it impossible to operate a kiln with fixed flow or speed settings. With the computer control system, the set points are generated and updated automatically, he said.

The computer calculates new set points using an algorithm based on history and current status of kiln variables, he stated.

The continuing increases in energy costs have strengthened the importance of power peak control in the St. Lawrence system, according to the spokesman.

A maximum monthly demand value is established and entered into the system. The system continuously monitors plant energy consumption and predicts a peak value. If the predicted current peak violates the established demand, an alarm is sounded, he said.

Also, a message is issued informing the operator which piece of equipment must be shut down to stay within the limits. Before starting any equipment, operators can ask the system if that equipment will use sufficient energy to violate the peak.

The system performs other tasks including temperature control for the bypass system, control of cement finish mill separator speeds and monitoring for alarm conditions, he said.

It atso provides other displays and information so operators can interpret equipment status. Operators can call up displays or demand printouts of process measurements, set points and alarm conditions.

Operators are also provided with a printout of comparative trends during the previous shift, he noted.

The St. Lawrence system was installed by Interautomation, a Canadian systems engineering firm. In addition to the computer with 32K of main memory, the system includes a cassette drive, character printer, disk storage, CRT display and teletypewriters.

Based on DEC CPUs

Measurex Mini Controls Plastics

CUPERTINO, Calif. – Measurex Corp. has announced a minicomputer-based system for the control of plastic sheet and film extruders and similar processes.

Based on Digital Equipment Corp. CPUs, the Measurex 2000/25 uses a dedicated 16-bit system for each line being controlled, a spokesman said.

The system's control center uses a computer chassis and operator's interactive color CRT which can also be remote-mounted outside the cabinet.

The system includes a terminal, printer/plotter and dual floppy disks. The disk is used for management information system functions and for information transfer, he said.

Measurement and control functions are independent of the data terminal.

The system costs about $125,000 depending on configuration. Add-on systems cost about $90,000. Measurex is at 1 Results Way, Cupertino, Calif. 95014.

GRC Has DEC-Based Micro

HARTFORD, Wis. – General Robotics Corp. (GRC) is offering a microcomputer system based on the Digital Equipment Corp. PDP-11/03 CPU and running under the DEC RSX11/M Real Time Executive.

The system, called the GRC11/03 RSX, includes the PDP-11/03 CPU with hardware muttiply, divide and floating point, 20K words of random-access memory, a Unibus port, a CRT, an 80-column printer and a duat double-density floppy disk as well as the RSX1t/M software, GRC said.

The system costs $17,000 from the firm at 57 N. Main St., Hartford, Wis. 53027.

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We won't be dwelling entirely on failures, of course. We'll spend a lot of time looking at successful DBMS applications, with stories from users, analyses of systems in use and case studies. All-in-all, it should help you manage your data base better. And it could help you avoid a costly mistake.

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Mini System Places Dealer's Dollars In Right Products at the Right Time

(Continued from Page 30)

"Other systems we looked at didn't allow for a software package that would best suit our needs," Baribault explained.

"For instance, most other equipment would require us to assign our own parts numbers to the various manufacturers' parts numbers. Since we have an inventory of 15,000 parts representing over 60 product lines, we felt the complexity of maintaining two separate numbering systems would make it extremely difficult.

"The Basic/Four equipment enables us to use the manufacturers' designations whether they're numeric or alphanumeric. Our people didn't have to learn a new procedure and our salesmen continue to use material they're familiar with," he said.

'Basic Philosophy'

"From the very beginning, our basic philosophy has been based on the idea that most computer systems are designed initially at the accounting level, then somehow work their way into customer service applications," Baribault explained.

"We felt that by addressing ourselves to the sales cycle and the inventory cycle, we would get the accounting function as a by-product. As distributors, these areas are much more important and much more difficult to deal with, since this is where the majority of our costs are," he added.

The only personnel to take the operator's course offered by the computer supplier were several of the clerical people who handle the basic DP.

Simple Learning Process

"With the small business computers designed the way they are today with simplified programming language very similar to everyday business terminology, the learning process is really quite simple," Baribault concluded.

Supermini Tape Drives Coming

NEWTON, Mass. – Magnetic tape users can expect to see developments that will include supermini tape drives featuring 1/2-in.-tape, automatic threading, speeds up to 125 in./sec and group code recording at 6,250 bit/in., according to Robert N. Tullos of Pertec Computer Corp.

Speaking at the Invitational Computer Conference here recently, Tullos told a group that "at the microcomputer end, tape cassette and cartridge systems are competing with floppy disk drives for the program loading functions."

But, at the other end, "mass store systems using magnetic tape are now being considered for the superminis," he noted.

"These will be smaller equivalents of large mass store systems such as the IBM 3850 and the Ampex Terabit systems" and may use wide 2.7-in.-tape, he said.

"A key consideration for these systems must be a transfer rate and format that emulates disk storage so data can be transferred from the tape store to disk and vice versa without going through the host processor.

"The overall objective is to reduce the need for tape-handling personnel to search libraries when files are needed."

New semiconductor developments cannot affect the mechanical parts of the tape drive, so those costs are not reduced by semiconductor Integration, according to Tullos.

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The Program

OCT. 6 – A.M.: NETWORK PROCESSORS

Popular mainframes and how they stack up for datacomm applications, with a look at how mainframe manufacturers are upgrading their machines' teleprocessing capabilities.

Datacomm software. How the trend to distributed DP and on-line data base systems is affecting data communications software offerings, and what changes users can expect with SNA-type networks.

Communications processors. Users detail their evaluation procedures for selecting communications processors for front-end and message switching applications.

Plus – a rundown on IBM's enhancements to its 3704/5 and the improvements they triggered in competitive front-end processors, as well as the state-of-the-art with the less-volatile message switchers and data concentrators. Also a review of processors and their role in centralized and distributed networks, with an update on networking techniques and protocols.

P.M.: TERMINALS

Terminal evaluation. Users give their individual formulas for appraising on-line interactive devices and data entry/processing terminal systems.

Teleprinters and glass Teletypes. A status report on the latest impact and non-impact machines and their CRT equivalents.

Microprocessors and semiconductor memories. How they are improving IBM 3270-compatible terminals.

Multifunction terminals. An examination of the trend to combine the traditional functions of data entry and remote batch terminals.

Latest vendor moves in intelligent terminals, and how users can best make the intelligence pay.

OCT. 7
A.M.: DATA TRANSMISSION SERVICES

Carriers. Leading users explain their rationale for selecting services from various carriers.

Tariffs. A study of Bell's latest tariffs, including MPL and DDS, with the latest on its switched digital offerings.

Satellites. A review of the services and tariffs of specialized and satellite carriers.

Value-added carriers. A tutorial on packet-switched services with a rundown on tariffs and carrier plans.

International services. A look at how they stack up for data communications in light of recent moves by the FCC and the international record carriers.

P.M.: MODEMS AND MULTIPLEXERS

Evaluations. Users assess modems and multiplexers and trace their trade-offs in making evaluations.

Latest developments with high-speed modems and the trend to intelligent multiplexers.

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Speakers announced for UPDATE program

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Auerbach

P. R. DeVane
Mfrs. Hanover

M. S. Huffman, Jr.
Comms. Mgt. Ctr.

G. Held
Civil Service

G. B. Bernstein
Naval Command

R. J. Kaufman
Damon

Leading datacomm users, consultants, and vendors are scheduled to address attendees at Data Communications UPDATE, sponsored by *DataComm User* magazine, October 6 and 7, 1976 at The Plaza in New York City.

Speakers and subjects to be covered include:

CPU's: Elizabeth F. Severino, Managing Editor, Auerbach Information Management Series. **Datacomm Software:** Ernest E. Keet, President, turnkey systems inc. **Communications Processors:** Gilbert Held, Acting Chief, Teleprocessing, U.S. Civil Service Commission; Clarence G. Marshall, Director of Advanced System Development for Communications Switching, Collins Radio Group/Rockwell International; Richard A. Loveland, Product Manager, Networks and Communications, Digital Equipment Corp.

Terminals: George B. Bernstein, Jr., Operations Research Analyst, U.S. Naval Supply, Systems Command; Daniel M. Printz, Marketing Planning Manager, Teletype Corp.; Gerald W. Fleming, Manager, Applications and Development, Data 100 Corp.; Les E. Staples, Product Manager, Data Communications, Datapoint Corp.; Loren Parsons, Product Manager, Applied Digital Data Systems.

Transmission Services: Stan M. Stanley, Administrator, Telecommunications, American Can Co.; Minor S. Huffman, Jr., Executive Vice President, Center for Communications Management, Inc.; Wayne A. Robins, Marketing Director, Data Services, AT&T; Ned Farinholt, Director of Market Services, Data Transmission Co.; Serge Wernikoff, Vice President, Planning, Western Union International; Dick Anderson, Regional Manager, Telenet Communications Corp.

Modems: Robert J. Kaufman, Operation Systems Project Manager, Damon Corp.; Farrel Peltz, Vice President, Regulatory Planning, Codex Corp.; George R. Grumbles, Vice President, Marketing, Universal Data Systems. **Diagnostics:** Paul R. DeVane, Assistant Manager, Communications Planning and Engineering, Manufacturers Hanover Trust. J. Lightsey Wallace, Assistant Director in Charge of Product Planning and New Product Development, Atlantic Research Corp.; James E. Palmer, President, Spectron Corp.

Dr. William A. Saxton, publisher of *DataComm User* and UPDATE chairman, states that the 2-day briefing "provides an excellent opportunity to catch up on the latest developments in data communications products and services." He also urges datacomm interests to register promptly since space is limited. *(Note: See accompanying advertisement for more details and registration form.)*

Design Procedues Changing

Full Use of Capabilities Cited as Challenge of LSI

By Toni Wiseman
Of the CW Staff

LOS ANGELES – The semiconductor large-scale integration (LSI) technology is producing major changes not only in the cost of computing power, but in the way in which computers are designed and built, attendees at the Western Electronic Show and Convention (Wescon) were told here last week.

"The microprocessor and memory devices now being used are just the beginning of the widespread use of LSI in implementing computer designs," Robert F. Wickham of Vantage Research, Inc. said.

Since projections of the technology indicate the present rate of increase in chip density and size will continue into the foreseeable future, the problem for both device suppliers and users becomes one of how to best utilize the LSI capability, he said.

The LSI technology of today, with more than 100 gate equivalents per chip, has progressed rapidly since the MOS process became a production reality in the 1969-1970 time period, Wickham told a session on "The Next Generation/The LSI Computer System."

"The memory market, pioneered by devices like the Intel 1103, brought the MOS/LSI technology to the computer industry," he said. "The memory and calculator markets provided the vehicle for large-volume LSI manufacture, which was required to perfect processes and circuit design techniques."

As a general-purpose programmable logic device, the microprocessor requires users to examine their problems from a different viewpoint, but the benefits far outweigh the problems, he stated.

Microprocessors and memories, therefore, led the widespread use of NMOS as the primary MOS/LSI technology, he added.

CW at Wescon

Current MNOS products include 4K-bit chips and 16-bit processor devices, Wickham said, observing chip densities and sizes can be expected to continue to improve at the current rate – a doubling of functions (gates or bits) per chip every two years.

"Late 1976 will see the introduction of 16K [random-access memories (RAM)] using NMOS process and 4K bipolar RAMs implemented using injection injection logic," he said.

And, with the introduction of injection injection logic the bipolar technology becomes quite competitive with MOS for building large circuit functions, he added.

Increases in circuit density and reductions in cost per circuit function similar to those on microprocessors and RAM devices are also occurring with read-only memory (ROM), programmable read-only memory (Prom), and electrically alterable read-only memory (Earom) devices, Wickham said.

Future Units

He predicted the system of the future will integrate all of these device types to obtain the best combination of economics, chip count, performance and reliability for a particular application.

"By 1980, we can expect 65K RAMs, 16-bit processors with on-chip ROM and RAM, electrically alterable 16K ROMs and a host of programmable support devices for practically any processor application," he stated.

(Continued on Page 38)

One-Board System May Cut OEM Cost

By Toni Wiseman
Of the CW Staff

LOS ANGELES – The introduction of the second-generation, single-board computer has given the OEM a powerful price/performance alternative for systems design, according to George Adams, OEM product manager for Intel Corp.

OEM systems designers have, in the past, been hindered in their system implementation efforts because their system volumes were too low to justify full component-based designs, he told attendees at the Western Electronic Show and Convention (Wescon) here last week.

"Previous board-level microprocessors did not provide adequate capability and flexibility without resorting to large multiboard systems," Adams said. "OEMs needed a low-cost, flexible and ready-to-use solution to answer these needs."

The solution, according to Adams, is the single-board computer such as the Intel SBC 80/20, which provides system expansion capability, increased on-board intelligence and peripheral control functions to reduce CPU real-time loading.

Microcomputers have also grown dramatically in volume and performance, he said, citing estimates that by 1980 microprocessor complexity will increase five to 10 times while execution time will triple, all at prices approximating those of today.

"If instruction set efficiency is assumed to show a direct correspondence with chip complexity, microprocessors will perform at levels 15 to 30 times those available today," Adams said.

The Real Question

The question facing OEMs is how to cost-effectively take advantage of these developments, he said.

A number of companies have begun to incorporate the power of microprocessor components into their products, but only through extensive component-level design expenditures, he said.

"Microprocessor chips may be used with dramatic cost effectiveness, but this effectiveness is extremely volume-sensitive," he pointed out.

Thus, for OEMs, the question really becomes one of "How can I take advantage of microcomputers without incurring the time and expense of a long component-based design?" he said.

Micros the Answer

The answer is obviously microcomputers on boards, Adams asserted.

But, he cautioned, while microcomputers on boards may provide an easy way to rapidly fabricate hardware, five other essential ingredients are necessary.

These include low cost, design flexibility and the ability to fit small systems on one board so system packaging hardware is minimized.

In addition, for those larger systems requiring additional memory, I/O and peripheral control, the micros must be supported by a full line of directly compatible system expansion boards and hardware.

(Continued on Page 37)

But May Lose Glamour

Hobbyist Called Growing Market

By a CW Staff Writer

LOS ANGELES – Although the hobby computer market will eventually mature and lose some of its glamour, a direct outgrowth will be the realization of a consumer computer for personal use, Robert F. Wickham of Vantage Research, Inc. said here last week.

In its youthful enthusiasm, the hobby market is helping establish the sales, service, education and distribution channels for small, low-cost computers to be used for educational, home and business purposes, he told a session at the Western Electronic Show and Convention (Wescon).

To serve the needs of the computer hobbyist, a new group of companies has come into existence, offering hardware, software and consumer-oriented marketing, Wickham noted.

"Considering that the LSI microcomputer has only been around for about four years, the hobby computer market has shown spectacular growth," he said.

"By mid-1976, an estimated 8,000 to 10,000 personal or hobby microcomputers were in use or under construction, with annual unit sales into this market expected to be at the rate of 10,000 to 15,000 per year for the next three years," he said, predicting there are about 200,000 to 300,000 potential owners of hobby microcomputers.

Cost is a major factor in this market, where a basic kit sells for $200 to $500 and assembled units retail for $1,000 and up, he added.

"Although the LSI chips keep getting cheaper, the items like power supplies,

(Continued on Page 37)

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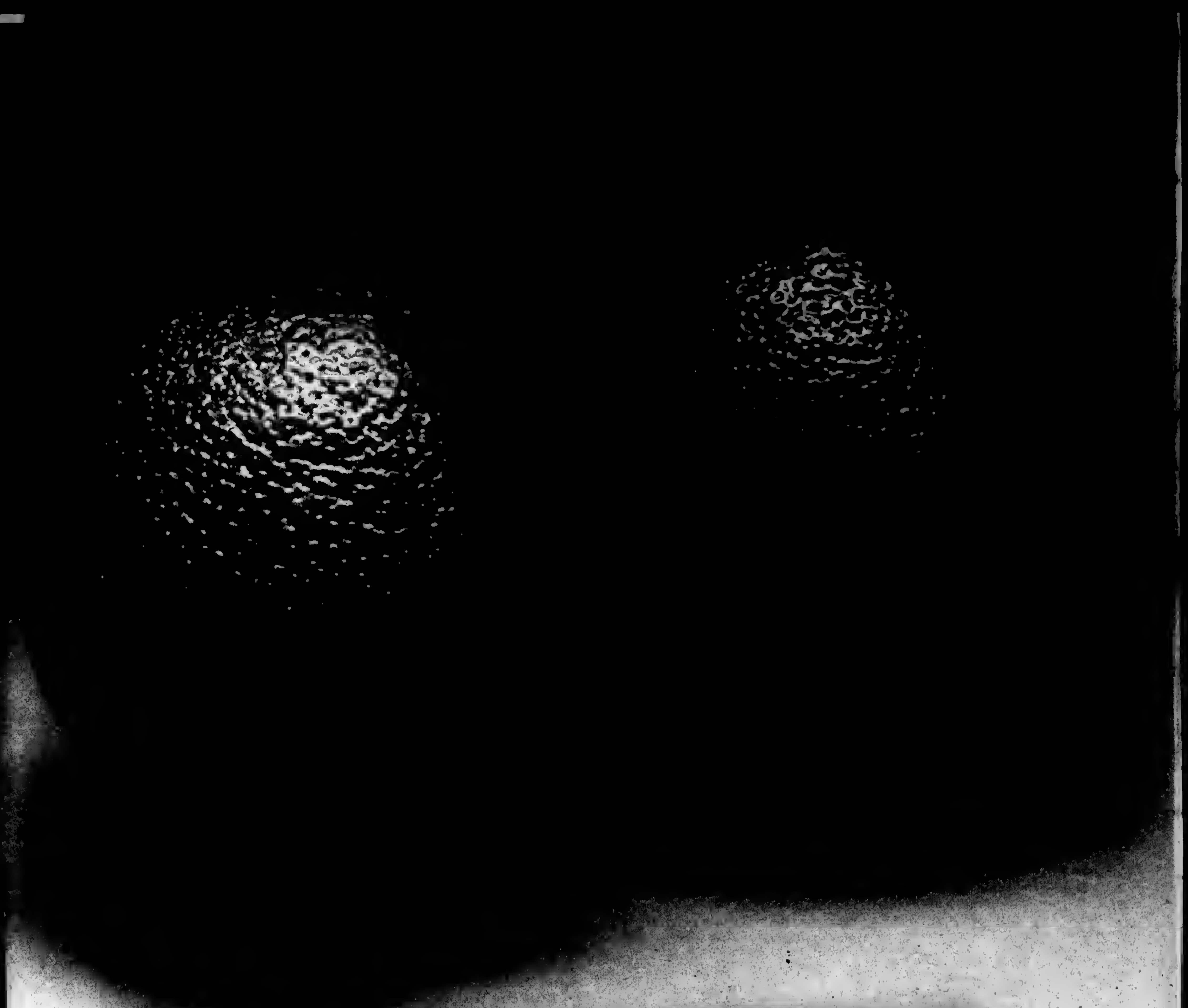

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In Near Future

Hobby Units Seen Evolving Into Personal Systems

(Continued from Page 35)

cabinets and front-panel hardware are not on such a steep price curve," Wickham noted.

Critical Factor

In addition to price, programming expertise is a critical factor in market growth, Wickham said.

"The availability of Basic for use with the [Intel] 8080 has been a boon to the market," he stated. "A surprisingly large number of people, both technical and nontechnical, have learned Basic in either high school or college classes."

Wickham speculated the ultimate limitation on the market is the user or potential buyer who wonders what he will use the computer for after it is assembled and tested.

In order to perform any practical functions, the computers must have some form of input and output terminals, more memory and perhaps some communications capability, he said.

"This runs the bill for the total system up to the $2,000 to $4,000 area, making it difficult for any but the true hardcore computer enthusiasts to rationalize the cost," he stated.

The consumer microcomputer can be expected to have a self-perpetuating market because one of the major new applications for the kits and syatems being developed now is in the education market, Wickham noted.

In addition to providing a market for hundreds of thousands of additional processors, many of the students will go on to be the hobbyists and experimenters of the future, he said.

"Perhaps the greatest long-term impact of the hobby computer market is to generate the products, sales, distribution and service network necessary for successfully marketing personal computers," he said.

"It may be that a less threatening name such as 'personal computational unit' will be adopted, since the personal computer will bear no resemblance to what we now think of as a computer," he contemplated.

Wickham predicted the system will have to be portable, have a universal high-level problem-solving language and be able to operate on a wide range of low-cost "canned" programs for such things as personal financial modeling, optimizing the times in competitive sporting events or determining the optimum time to sell or trade the user's automobile.

"Systems with true consumer marketability will probably not appear until the early 1980s because of the problem of the human interface," Wickham predicted.

"However, the equipment and techniques being developed for video games and the educational markets will provide many of the required low-cost solutions to the input/output and programming problems," he stated.

System on Board Gives Designer Lower Cost Tool

(Continued from Page 35)

"The fifth major characteristic needed by board-level microcomputers is that of complete software and hardware development support tools geared for OEM systems design," Adams stated.

Increase Capabilities

OEMs must also try to gain further advantage from these low-cost computers as well as to configure them into larger systems with increased capability, he added.

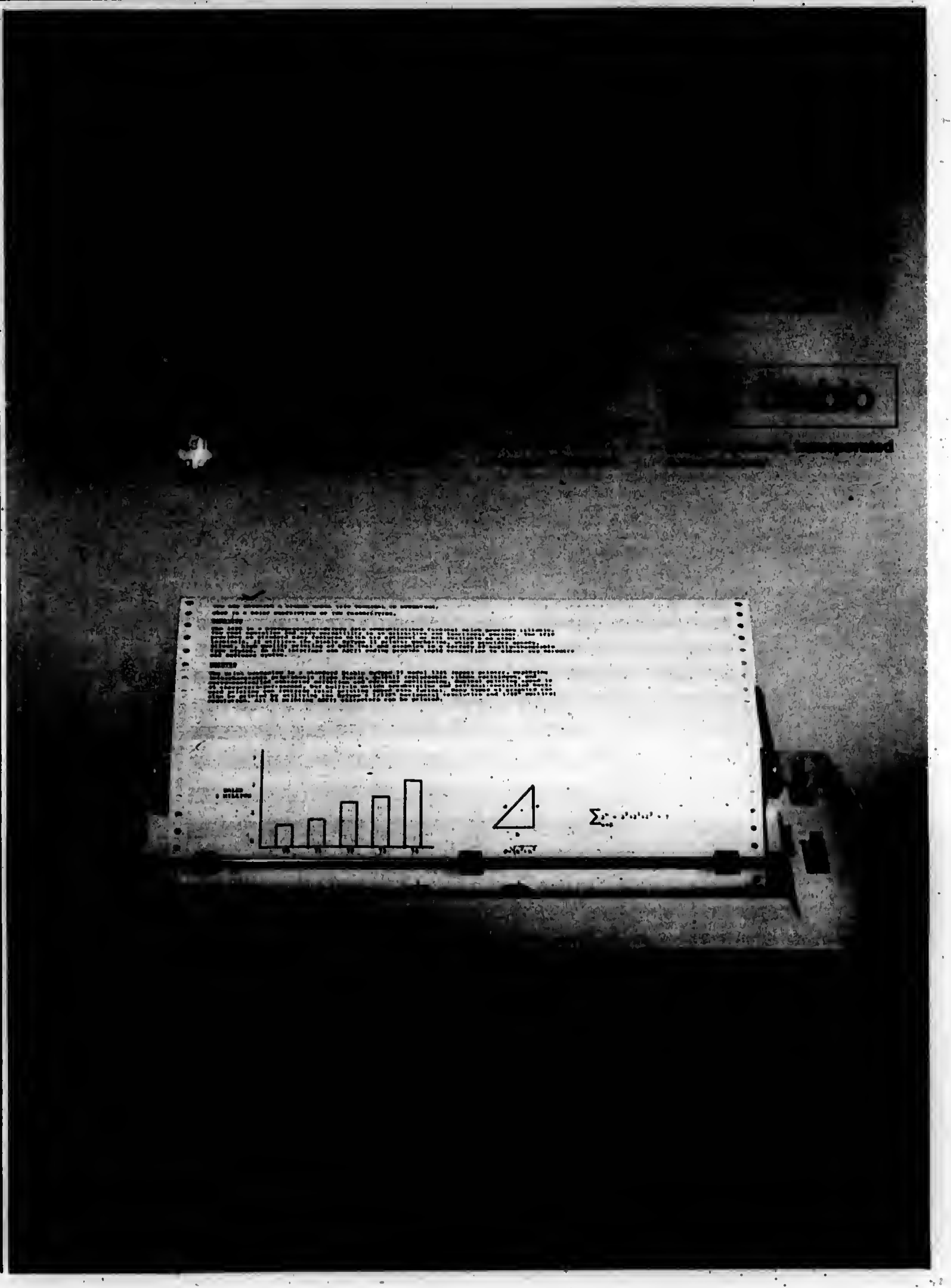
"The first problem is answered through provision for more capability on the single printed circuit board," he said. "This will provide an increase in the intelligence of on-board real-time handling and peripheral control, which reduces CPU loading."

Solution to Another Problem

The problem of larger systems with increased capability is answered through the addition of full multiprocessing control so system resources and tasks may be shared via the system bus, Adams said.

"These performance increases provide dramatic increases in system capability. Additional benefits include enhanced system reliability and the ability to tailor the cost of system intelligence to system requirements in a flexible and modular manner," he said.

"The use of multiple low-cost computers with these capabilities would allow system capability to grow with applications requirements at low initial and low incremental cost," Adams stated. "This avoids processing overkill."



Competition, Technology Factors

Design Costs of Micro-Based Products Seen Falling

By Toni Wiseman
Of the CW Staff

LOS ANGELES – Several trends are emerging to reduce the high cost of developing large-scale integration (LSI) microprocessor-based products, among them microcomputer board sets, Manny R. Lemas of Microcomputer Associates, Inc. said here last week.

The cost reductions reflect the increased availability of microcomputer development and production hardware and software as well as the accelerating sophistication of the micro user, he told an audience at the Western Electronic Show and Convention (Wescon).

"Generally speaking, the trends are seen to be predictable in that they are following the general course of events experienced by the minicomputer evolution of a decade ago," Lemas said.

Among these trends are the decreasing cost of hardware, a move from components to assembled boards, sophisticated development systems and support and a move from Assembly language programming to higher level languages, he explained.

More functions per chip, special function chips and de facto standard support chips are also reducing costs, he said, as are standardized peripheral devices.

"Microprocessor prices have been halved, thirded and quartered," and programmable read-only memories, random-access memories and support chips "have also followed suit," Lemas stated.

The steady drop in prices is attributable mostly to improved semiconductor processing technology and keen competition, he observed. Competition has in fact been so keen that profit margins in many cases have been dangerously trimmed, he said.

"Although this price decrease cannot be expected to continue forever, the fact is that a trend toward more-function-per-chip can be expected to continue, and this should provide an effective decrease in net price per function," Lemas stated.

The availability of low-cost assembled microcomputer boards and board sets has induced many users, particularly low- to medium-volume manufacturers, to buy assembled subsystems instead of components, Lemas said.

Although microcomputer assembled boards are not new to the industry, the semiconductor houses only recently began to supply them, he said. It is a very attractive business for these firms as it represents a market for their complete line of circuits, memory and support chips rather than processors alone.

"It also heralds another trend, that of semiconductor manufacturers moving to boards, board sets, enclosures and eventually to systems," Lemas said.

Using All Capabilities Called Big Challenge Of LSI Technology

(Continued from Page 35)

"The limitations in future products lie not with the semiconductor technology, but with the ability of suppliers and users to evolve standard circuit functions which can take advantage of the economics of high-volume semiconductor production," Wickham said.

Semiconductor devices can now place a significant amount of a computer system on a chip, he noted, but added the chip design is a compromise because of limitations of chip size, power dissipation, packaging, production volume and performance.

"We are already into the stage, however, where the chip design must also take into account the system architecture and the system software," he added.

"For this reason, system design, software and semiconductor chip design must now be done at the same time in an integrated process in order that the most efficient trade-offs in each area may be made," he said.

The primary area of application for LSI devices appears to be in the small to medium-sized general-purpose processors, the 8-bit and 16-bit machines, Wickham stated.

The emphasis on this size machine will continue because of the semiconductor manufacturers' need to achieve high production volume with a minimum of software support while maintaining reasonable average device selling prices, he said.

At the very low end will be application-oriented, one-chip processors priced at less than $5 in large quantities. At the other end, the very large DP and scientific machines will require relatively small numbers of high-performance devices, many of which will be customized or in some way customer-unique, he predicted.

The primary areas of product concentration to date have been the processor and memory devices, he said. The current limitation factor for the small and medium systems is input/output.

Work in this area "should lead to a wide variety of programmable interface/control devices for such things as memory control, communications, encryption of data, error checking and correcting, peripheral control and high-level language translation.

"This will permit 8-bit and 16-bit systems to be lower in cost and adaptable to more applications. These intelligent functional subsystems will be under CPU control and will provide the basis for highly efficient function-oriented multiprocessor systems," he said.

As the problem of I/O functions becomes a more routine matter, processor and memory will have evolved to the point where multiple close-coupled processors may be used for the CPU, marking the beginning of the small task-oriented multiprocessor system where input tasks are allocated to a processor under program control, he stated.

"As hardware prices drop, programming becomes the major problem. Hardware will be used to help solve a large part of the software problem, resulting in the increased use of computers," he said.

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Cost for the seminar, including workbook, reference materials, luncheons and continental breakfasts is $350 for the first registrant, and $300 for additional registrants from the same company.

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Peripherals Seen Playing Important Role at CDC

NEW YORK – Control Data Corp.'s recent series of product announcements are an indication of the importance of disk, printer, memory, tape, card and display products in the firm's overall computer business activities, according to Gordon R. Brown, senior vice-president for peripheral products.

"One measure of our total commitment to the computer peripherals industry is the revenue contributed to Control Data's overall computer business," he said.

25% of Computer Business

"This grew to a level of nearly $320 million in 1975. That's more than 25% of the corporation's computer business volume for last year," he noted, adding CDC has now reached a point in its development where its major ongoing programs emphasize concentration of assets and increasing returns rather than across-the-board expansions.

It is important for CDC to concentrate its technology programs and market development in those product areas where it has achieved a leadership role, Brown said.

Cooperation is the key to CDC's current strategy, he asserted.

"Our cooperative programs today involve joint-venture development and manufacturing of nearly all the Control Data peripherals.

"And the majority of these programs have developed from the base of our valued OEM-supplier relationships over the past 15 years with systems manufacturers such as Honeywell, NCR and [International Computers Ltd. (ICL)]," he said.

Advantages of Joint Ventures

Brown noted there are numerous advantages to be found when larger companies join to establish businesses that specialize in selected areas of product development and manufacture.

"This is especially true in the computer peripherals industry where shared development and start-up costs – coupled with a large, assured product base – combine to increase the overall stability of the parents of these joint businesses," he said.

"The cost of entry into new product areas is prohibitively expensive. Unfortunately, we've all seen far too many examples of these expenses in the last few years with the departure from our industry of such firms as [General Electric], RCA, Xerox, Singer and others.

"We see cooperative programs as a means of stabilizing the business costs for those companies still in the industry and enabling all of us to compete from more nearly equal bases," Brown stated.

While cooperative ventures are not easy to get started and require extensive work to achieve the potential benefits, they can be highly successful, as witnessed by Computer Peripherals, Inc. (CPI), the joint NCR/CDC venture, he said.

CPI has further strengthened its position through the addition of ICL as a third partner, he noted.

CPI Products

The first product developments from CPI – Control Data's mass storage facility – were announced at the 1975 National Computer Conference (NCC) and customer deliveries have begun.

A group of OEM horizontal bank printers introduced at this year's NCC represent the first equipment completely conceived and developed by CPI, Brown noted.

In the area of rotating memory equipment, CDC has joined forces with Honeywell in Magnetic Peripherals, Inc. (MPI).

"Separately, it would be very expensive for both Honeywell and us to serve the needs of this very large peripheral market area," Brown said.

"But together, our ability to spread development and start-up costs over a large production base means far greater stability in this vital segment of our business," he stated.

MPI's recently announced "Winchester"-technology mini-module drive, a fixed disk drive called the Falcon and a floppy disk subsystem, along with CPI's band printer family, "represent our growing awareness of the rapid growth potential for highly reliable, moderately priced peripheral products in the minicomputer system marketplace," Brown said.

Contracts

Beehive Medical Electronics, Inc. has signed a $6.1 million, three-year contract to deliver Super Bee 2 and 3 terminals and printers to the U.S. Custom Service.

Univac has received a $36.6 million contract from the Federal Aviation Administration to enhance and expand the Automated Radar Terminal Systems (Arts III) equipment.

Western Union Teleprocessing, Inc. has ordered about 15,000, 150 bit/sec modems from General Datacomm Industries, Inc. for use in its TWX network.

EDP Corp., a subsidiary of Anacomp, Inc., has signed a contract to design and install a financial system for Credivit Financia of Brussels, Belgium, a subsidiary of First National City Bank.

Shugart Associates has added General Electric and Tandbergs Radiofabrikk A/S of Norway to its list of SA800 floppy drive customers.

Informatics, Inc. is continuing to operate the National Aeronautics and Space Administration's Scientific and Technical Information Facility at Baltimore/Washington International Airport under a new one-year contract.

National Data Corp. has signed an extended term contract with Security Pacific National Bank of California to provide credit-card authorization services.

Hudson's Bay Co. has contracted with Datacrown Ltd. to provide processing on its retail store applications and corporate business systems and plans to phase out a regional in-house system.

Mathematica, Inc. was selected to design and implement N.J.'s third instant lottery. The firm will use its Compu-Instant system.

Century Computer Corp. has contracted to buy about $750,000 worth of tape and disk drives from Pertec Corp.

Searle CT Systems has signed a contract valued at over $1 million for Interdata Corp. 256K-byte Model 8/32 computers, which it will install in its computerized tomographic scanning system.

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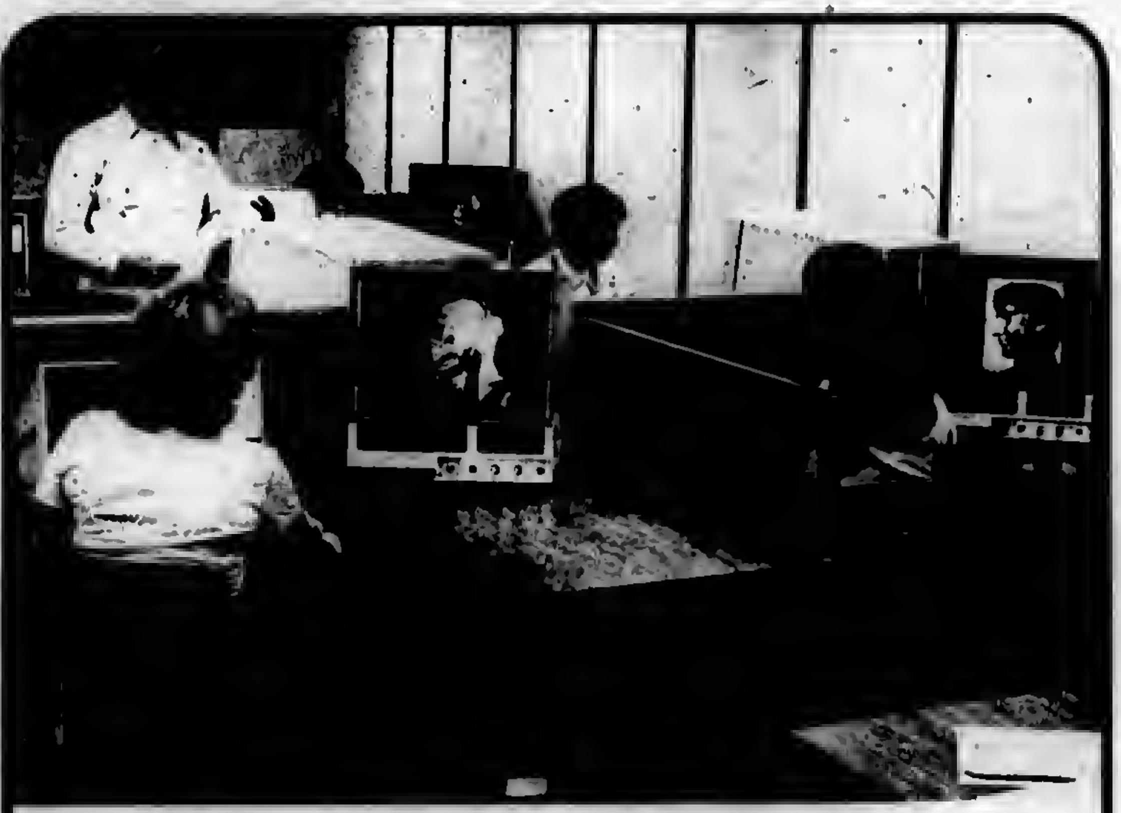

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Commerce Reports DP in India Provides Growing Import Mart

WASHINGTON, D.C. – "Initially, the introduction of computer equipment to the Indian market had a rather checkered history. Now the country appears to have acquired a high level of computer consciousness," according to the U.S. Department of Commerce's recently issued "Market Research Report on Computer Peripheral Equipment" in India.

"In the fifth Five-Year Plan [1974-1978], the government of India's Department of Electronics anticipates an investment of $100 million and, during this time, it has placed the country's requirement for computer systems, peripherals and interface electronics, including peripheral controllers, at about $172 million," the Commerce Department said, noting that this figure includes an import content of about $90 million.

One of three reports on India recently issued by the department, the study said the demand for minicomputers will increase from 880 systems in 1974-1978 to 2,665 systems during 1979-1984.

The need for midi computers will jump from 240 to 491 systems in the same time frame, while cost estimates will jump from $172 million to $441.4 million.

The Indian government is creating six regional national computer centers to design software systems, computer network systems and major application programs and study the portability and adaptability of software, the report said.

The government's current import policy grants import permits only for those computers that are essential and cannot be obtained locally, the study noted.

Three Manufacturers

There are three computer systems manufacturers in India, the native Ecil, IBM and International Computers Ltd. (ICL). Ecil assembles CPUs based on imported components and depends on outside sources for peripherals, the Commerce study indicated.

IBM produces card equipment and rebuilds 1401s. Ecil, as of March 1976, had produced 69 systems. ICL is licensed to manufacture 1901As.

The Department of Electronics plans to establish a production capacity of 200 minicomputers a year. The department is reported to be considering granting 10 industrial licenses in conjunction with this plan.

No domestic capability currently exists for such peripherals as high-speed line printers, teletypewriters, disk memories and key-to-tape systems.

The study includes a profile of the domestic market and an end-user analysis as well as a list of major prospective customers and principal trade, industrial and professional associations.

Another report, "Market Research Report on Electronic Components," includes a profile of the end-user market as well as a product analysis and a look at the demand for electronic components in India.

This report also includes a listing of domestic manufacturers and data on market development.

"Market Research Report on Electronic Industry Prodction, and Test (EIPT) Equipment" contains similar information for the EIPT market.

The study noted the Indian market for both new and replacement EIPT equipment during fiscal 1975-1976 was estimated at more than $44 million; during 1976-77, nearly $50 million worth of similar equipment will be required by domestic electronics industry end users.

Copies of all three reports are available at $10/copy from the National Technical Information Service, U.S. Department of Commerce, P.O. Box 15553, Springfield, Va. 22151.

International News

Fujitsu Nets M Series Orders

TOKYO – While Amdahl Corp. reportedly has received orders for over 35 of its 470V/6s from U.S. customers, Fujitsu's M series is also doing well, according to *EDP Japan Report* (EDP/JR).

Fujitsu has received 21 orders for the M-190, nine for the M-180 II and 22 for the M-160.

Over 70 of these orders are claimed to be for IBM replacements.

Domestic Vendors' Sales Up, Foreign Makers Slip in Japan

TOKYO – Japanese computer manufacturers reported an upswing in domestic sales during the last quarter of 1975 compared with a marked decline in sales by foreign manufacturers, according to *EDP/Japan Report* (EDP/JR).

Domestic manufacturers reported shipments of 1,031 computers valued at $227.3 million. This represented a 2.4% increase in number and a 34.4% increase in value compared with the third quarter of 1974.

Imports Declined

Foreign makers delivered 626 units valued at $259.4 million, EDP/JR said. This was a decline of 255 units compared with the year-ago period.

"Japanese makers' superior performance during this particular period can be partly derived from the stable nature of the public sector of the market," which includes central and local government, according to EDP/JR.

"In the public sector, there is a rather clear pattern as to order placement and shipment scheduling. Customers tend to place orders during the first half of the fiscal year and makers deliver products during the latter half of the year without fear of cancellation due to changes in economic conditions during that period," EDP/JR reported.

In terms of the installed base of 33,715 units, Japanese makers account for 21,203 while foreign makers claim the remaining 12,512 units.

Itel, Dier Form Joint Venture To Penetrate Pacific Basin Area

SYDNEY, Australia – Dier Computer Corp. and Itel Corp. have entered into a joint venture to penetrate the leasing and specialist computer products markets in Australia and Southeast Asia.

The companies are equal partners in the venture, which will be known as Dier-Itel Computer Corp. Pty. Ltd.

The joint venture will make available to Dier, based here, complex lease financing expertise from Itel, rather than introduce any new sources of financing, according to the UK's *Computer Weekly* newspaper.

In addition, the venture will provide Dier with a convenient and experienced source of software and IBM plug-compatible memory and disk products, *Computer Weekly* said.

Develop Markets

The objectives of Dier-Itel will be to use Itel's financing expertise to "develop markets for products and financial services hitherto undeveloped in the Pacific Basin," according to John B. Dier, managing director of Dier, and John Clark, president of Itel's Computer Products Division.

Dier noted that Itel offered "sophisticated lease structures" which would incorporate advantages for the Australian government investment allowance and tax benefits.

Itel had considered a new relationship with Dier by buying Dier's 50% equity, which is up for sale, but had instead decided the joint venture was cheaper for its objectives in Australia, Clark told *Computer Weekly*.

Dier has offices and sales centers in the Phillipines, New Zealand, Singapore and Hong Kong.

ICL, NCR Get UK Award For '75 Export Achievement

LONDON – International Computers Ltd. (ICL) and NCR Corp. have been awarded the Queen's Award for export achievement in 1976.

Both companies were able to claim record figures, according to *Computer Weekly* newspaper.

ICL's exports now constitute 40% of its production output, valued at $117 million a year.

Dundee, NCR's largest manufacturing plant outside the U.S., is currently exporting 85% of the factory's output and recorded export orders worth $50 million in 1975, according to *Computer Weekly*.

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Off-the-Shelf 8-Bit Micro Advocated As Standard for Military Systems

By a CW Staff Writer

LOS ANGELES – In searching for standardization of microcomputer-based military systems, Ralph Martinez and Reeve Peterson of the Naval Electronics Laboratory Center recommended starting with a commercially available 8-bit CPU.

Technology is not sufficiently advanced to permit standardizing on a 16-bit or slice CPU, they told a session at the recent Western Electronic Show and Convention (Wescon) here.

Any one of several commercially available 8-bit CPUs, militarized and procured to Navy specifications, would be satisfactory for the 8-bit interim standard, they said.

The standard instruction set for the unit would be defined by the 8-bit CPU selected. They did not recommend a custom instruction set tailored to Navy system requirements.

Expensive Alternative

The alternative to selecting an off-the-shelf unit would be to spend two to four years in development time and $2 million to $10 million for a custom 8-bit CPU, they said.

Specifications should standardize on functional modules which can be interconnected to form computer systems, they said.

Hardware standardization is most effective at the highest level of hardware complexity that is common to both distributed architecture, embedded systems and general-purpose computers, they observed.

The hardware and software support functions should be selected by competitive procurement in order to gain the best combination of performance, delivery, multisourcing availability and cost, Martinez and Peterson indicated.

Second Sourcing

Second sourcing should be required for all modules because price and availability tend to be stabilized when more than one source exists, they said.

In addition, they noted, second-source availability for microprocessors implies very high volume device fabrication which is necessary for high reliability.

Hardware and software support systems should be standardized since the microprocessor is used as a device (universal building block) by the engineer and requires sophisticated support hardware to program and debug software/firmware, according to Martinez and Peterson.

HP Consolidating Disk Activities In New Division Based in Boise

CUPERTINO, Calif. – Hewlett-Packard Co. (HP) is consolidating its disk products activities into a Disk Memory Division based in Boise, Idaho.

The new unit will design, manufacture and market the firm's disk memory products and controllers. Until now, responsibility for these products has been assigned to various departments within the Data Systems Division.

In announcing the new divisional status, Paul C. Ely, general manager of the Computer Systems Group, said "disk products are an important and rapidly growing segment of our computer business.

"We are devoting an increasing portion of our R&D resources to assure continued success in this product line," he added.

The new division, part of the firm's Computer Systems Group, officially begins operation Nov. 1. Richard A. Hackborn has been named general manager. He formerly was computer group engineering manager.

The Disk Memory Division will share HP's facility in Boise with the Boise Division, which manufactures line printers and tape drives. Division activities will be shifted from Cupertino to Boise in a series of moves over the next two years, Hackborn said.

Modcomp Lays Off 250 Employees

FORT LAUDERDALE, Fla. – Modular Computer Systems, Inc. (Modcomp) layed off 250 employees in an across-the-board personnel reduction in response to the firm's recent $3.8 million loss for the second quarter ended June 30 [CW, Aug. 30].

The cuts, affecting about 23% of the firm's employees, leave the mini maker with about 850 employees.

About 90 people in manufacturing, as well as others in development, marketing, sales, administration and international operations, were cut from the firm's personnel roster, a spokesman said.

Consulting Firm Set For Health, Hotel DP

BOSTON – Keane Associates, Inc. and Larry Chervenak have agreed to form a corporation, Chervenak, Keane & Co., Inc., which will offer consulting services in operations, DP and related technology in the hotel and health care fields.

The corporation will be equally owned by both parties.

Keane supplies software services and offers facility management services to hospitals and nursing homes.

Chervenak was formerly chairman of Harris, Kerr, Chervenak & Co., which has experience in health care and hotel operations, DP and related technology, according to Keane Corp.

The staff of that company will become part of Chervenak, Keane & Co., Inc., which will be headquartered in New York with regional offices in San Francisco; Kansas City, Mo.; Boston; and San Juan, Puerto Rico.

Md. Firm Specializes In Lease Operations

ROCKVILLE, Md. – Equipment Leasing and Management Co. (Elmco), has been formed to specialize in leasing computers and peripherals to users and provide opportunities to invest in tax-oriented leveraged leases.

Elmco is headed by E. Lee Meadows, former executive vice-president of Computer Leasing Co.

Elmco will also manage computer portfolios for leasing companies and other owners, provide leasing plans for manufacturers and deal in uscd computer equipment.

The firm's address is P.O. Box 246, Rockville, Md. 20850.

NDC Creates Group For Communications

ATLANTA – National Data Corp. (NDC) has formed the Advanced Systems Group to market, design and manage telecommunications and data communications systems.

In some instances the group will design a communications system, while in others it will design, install and then manage the system for the customer, according to L.C. Whitney, NDC executive vice-president.

Expansions

Ontel Corp. has enlarged its manufacturing facilities with the addition of 60,000 sq ft of plant space in Woodbury, N.Y.

Educational Data Systems, Inc. has moved to a larger, 10,000 sq-ft facility in Irvine, Calif.

Courier Terminal Systems, Inc. will move its headquarters and manufacturing facilities to Tempe, Ariz., where a 152,000 sq-ft plant is being built.

Republic Service Bureau, Inc., a DP firm specializing in the real estate and construction industries, has relocated its facilities to Torrance, Calif.

Braegen Corp. has moved to a 22,000 sq-ft facility in Cupertino, Calif.

Entrex, Inc. has doubled its manufacturing facilities with the acquisition of a new building giving it about 100,000 sq ft of space in Burlington, Mass.

Shugart Associates plans to construct a 60,000 sq-ft facility in Sunnyvale, Calif., to house its administrative, manufacturing, R&D and warehouse functions. Occupancy is scheduled for November.

Basic/Four Corp. plans to occupy a new, 170,000 sq-ft facility in Tustin, Calif. A 110,000 sq-ft building will be for manufacturing and a 60,000 sq-ft facility will house the firm's administration, engineering and research.

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Manitoba Data Services, a Division of the Manitoba Telephone System provides computer services to a variety of clients in both the governmental and public sector. The computer centre is presently operating an IBM 370/168 and two 370/158 computers under SVS/HASP control. A large and rapidly expanding teleprocessing network provides remote job entry, time sharing and online update and information retrieval facilities.

The Operations Support Services Division of Manitoba Data Services is responsible for the provision of new functions and increased productivity for clients, as well as improved performance and additional capacity within the computer complex. To meet the increasing demands in these areas, OSS requires several data processing professionals with extensive experience in a large scale multi CPU environment to function within the following capacities:

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Responsible for project leadership, in the identification, assignment and control of tasks within a detailed project activity plan. Also responsible for providing consultation and technical guidance to the computer centre users. A minimum of 5 years experience in systems software, including the installation and maintenance of virtual operating systems and teleprocessing systems is required.

Salary: up to $21,180.00 per annum, commensurate with experience and qualifications.

ADVISORY TECHNICAL SPECIALIST

Responsible as a member of a project team, for carrying out tasks related to the installation, maintenance or control of system software.

This position requires a background of several years development, maintenance, and performance tuning experience in one or more of the following areas: Operating Systems, Information Management System, Network Control Program.

Salary: up to $18,168.00 per annum, commensurate with experience and qualifications.

Please submit application, including a complete resume to:

MANITOBA DATA SERVICES
Personnel Department
101-489 Empress Street
Winnipeg, Manitoba.
R3C 0A2

If your expertise demands a truly dynamic environment... try Digital's CIS.

Digital's Corporate Information Services has a charter to service the systems/applications requirements (design and installation) for the Corporation. To meet this goal, Digital's CIS is responsible for the full range of Information Services requirements from maintenance to new generation breakthroughs. The individuals we seek will be asked to utilize their experience, innovatively and creatively toward results-oriented objectives. Some objectives will be standard, some will be "firsts" – all will provide you action and challenge and technical/managerial career paths.

Project Managers

Business Systems

As a result of our dyanamic growth, we can offer exceptional opportunities to professionals with proven managerial and business systems development ability. Working within our CIS systems organization, you will assume managerial responsibility for planning, developing, and implementing major systems which will effectively address and solve real business problems in one or more of the following areas: Personnel, Treasury, Finance and Accounting, Sales, Order Entry, Inventory Control and Production Control.

Although a solid background in EDP is necessary for all of these positions, it is essential that these managers have a strong business orientation and a knowledge and appreciation of user requirements and the need to provide solutions in a timely and cost effective manner. In addition, these managers must be able to effectively structure the development cycle and develop systems which will anticipate future requirements and essential controls in a high growth environment.

Senior Business Systems Analysts

Positions are also available for experienced (3-5 years) business systems analysts in the aforementioned business areas. These analysts must have a strong applications background and be able to take a project from start to finish including definition, design, programming and implementation. In addition, they must understand the systems develpment cycle, and related project control techniques in order to develop effective systems to solve real business problems. These positions also offer an excellent opportunity for both technical and managerial growth and require professionals who can grow to assume expanding responsibilities.

Telecommunications

Operations Manager
Project Leaders
Individual Contributors

Digital seeks individuals at more senior levels who are experienced in computer and communications networks and message switching. These individuals will have the opportunity within Digital's Corporate Telecommunications function to take existing facilities and enhance them, as well as participate in the development and introduction of the next generation of systems.

For the innovative with the ability to positively achieve goals, Digital has openings for Operations Managers, Project Leaders and Analysts. Knowledge of the technology of the communications hardware/software and on-line applications is necessary. Knowledge of Decsystem-10 and PDP-11 is helpful.

The following positions are available with our Information Processing Center for professionals with strong hands-on operations and software skills who can contribute within a highly responsive service organization with responsibility to provide cost effective time-sharing and batch production services to the company.

Project Managers

Communications Networks

Positions are available for project software professionals of demonstrated ability to plan, integrate and supervise the development of large scale communications networks. This position requires 2-3 years experience in any large communications network similar to ARPANET as well as experience in remote job entry devices and multiplexer networks. Knowledge of both large and small computer systems is essential and experience on either. Decsystem-10 or PDP-11 systems would be most desirable.

File Archiving

This position requires a project leader with 2-3 years experience who can plan, integrate, and supervise the development of systems for long term storage of computer files with convenient restoration capabilities to be integrated with current systems.

Systems Acceptance and Standards

This is a high visibility position for a person who can effectively implement systems in the financial area.

As manager you'll be expected to direct a systems analysis group in the improvement of current standards, including present documentation in the development of new systems targeted for production mode in operations.

You'll need at least 8 years experience in operations programming and systems. Candidate selected may now be employed in the audit function of a large corporation with Data Processing exposure. A degree in Computer Science, Business or equivalent is preferred.

Manager of IPC Planning

Our Information Processing Center/User Planning Function requires a manager who can successfully participate in short and long term planning of hardware requirements, based on new business systems. This function will be in support of new applications for financial, manufacturing and field service.

The ideal candidate will have a good knowledge of hardware, especially the large system DEC-10 and thorough exposure to data base and systems design.

Senior Programmers

You will be responsible for providing support to our in-house user community, troubleshooting, user consulting and training and application maintenance. You should have a thorough knowledge of COBOL and assembly language and 3-5 years experience with COBOL compiler support or data base system internals. DECsystem-10 experience is helpful.

Systems Performance Analysts

The Performance Evaluation Group in Digital's Information Processing Center has openings for professionals with a strong programming background and experience in computer system performance measurement and analysis. Duties will include the investigation of a wide variety of performance-related issues on large DECsystem-10's, 20's, and PDP-11/70 systems in production EDP and timesharing environments, using both software and hardware measurement tools, as well as the development and support of new measurement tools and techniques.

A Bachelor's degree in Computer Science or Mathematics, or equivalent is required, along with at least 4 years of programming experience (including assembly language) and 2 years of involvement in system performance analysis. Familiarity with one or more of the above systems is a definite plus.

Forward resume outlining salary requirements and indicating position desired to Brian McDonald, Digital Equipment Corporation, Dept. G920, 162 Main Street, Maynard, Mass. 01754.

d i g i t a l

digital equipment corporation

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SALESMAN/MANAGER

Our client company is a small but profitable company which enjoys a splendid reputation. It is growing rapidly and has the potential for doubling sales and profits each year for the next several years. Its people are intelligent, likeable and successful. They work well together as a team. The products are software packages of the highest quality which enjoy good customer acceptance.

We are searching for an outstanding salesman who is well qualified for the immediate opening and has the potential and experience to grow as rapidly as the company. To qualify, one must have:

- A likeable, aggressive personality
- An excellent educational background
- Successful data processing sales experience
- High intelligence and high energy
- Ambition coupled with a team spirit
- Excellent character

If you believe you qualify, please send your resume in confidence to Jim Cox.

professionals for computing

465 California St., Suite 504
San Francisco, Calif. 94104
An Equal Opportunity — Employer Retained Agency

TERMINAL SYSTEMS DIVISION

Cambridge, Ohio

SENIOR SOFTWARE ANALYST

To contribute significantly to the investigation of future software systems for retail Point-of-Sale products/systems. This individual will bring a rather broad academic and experience background computer system software design for a variety of computer architectures. Will also be involved in projects whose objectives will be to reduce the risk of computer technologies which are candidates for implementation in our most major P.O.S. product development cycle.

An MS degree plus some rather broad experience with computer system software design would be appropriate.

This is a key position in the overall development of our future P.O.S. system providing high visibility and growth.

We invite you to respond for an early reply.

Robert W. Donovan
Terminal Systems Division - Cambridge
NCR Corporation
Cambridge, Ohio 43725
Phone: (614) 439-0398

NCR

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1976 Computer Salary Survey.

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"The Next Step", Source Edp's tenth annual salary survey and career planning guide, is now available. You'll also receive without charge our latest "Digest of Computer Opportunities" describing specific career openings currently available within our client organizations nationwide.

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Source Edp Corporate Headquarters
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Chicago, Illinois 60606
(P.S. Be sure to use home address and indicate position title.)
Or call your nearest Source Edp Office:

source edp

East: Boston (617/237-3120), New York-New Jersey (201/687-8700), Philadelphia (215/665-1717), Washington, D.C. (703/790-5610).

Midwest: Chicago (312) 782-0857), Cleveland (216/771-2070), Detroit (313/352-6520), Kansas City (816/474-3393), Minneapolis (612/544-3600), St. Louis (314/862-3800).

South & Southwest: Atlanta (404/634-5127), Dallas (214/638-4080), Fort Worth (817/338-9300), Houston (713/626-8705), New Orleans (504/523-2576).

West Coast: Los Angeles (213/386-5500), Irvine, CA. (714/833-1730), Palo Alto (415/328-7155), San Francisco (415/434-2410).

DIRECTOR OF COMPUTING CENTER

Desirable Qualifications: 1) Strong managerial abilities, oral and writing communication skills, and ability to work with both academic and administrative users; 2) Knowledge and experience in design and development of information systems; 3) A doctorage or commensurate experience would be advantageous; 4) Familiarity with a Burroughs 3500 is desirable.

General: Starting salary range: $18,000 - $20,500 for a twelve-month obligation. Applicant should be available on November 1, 1976. Applications and/or inquiries should be directed, prior to October 4, to Mr. William Mombart, Director of Business Affairs, State University of New York, Agricultural and Technical College, Alfred, New York, 14802.

An Equal Opportunity/ Affirmative Action Employer

OPERATING SYSTEMS PROGRAMMER

Major Philadelphia bank is seeking an addition to its technical support staff which has responsibility for maintaining the software environment for a 370/158. On-Line System (IMS/DB/DC). Responsibilities will include evaluation of hardware and software as well as involvement with CPE.

The successful candidate would have 2-3 years direct experience with OS or VS operating system generation and maintenance. Initial salary to $20,000. Please send resume in confidence to:

**A-93, P.O. Box 17182
Phila, Pa. 19105**

Equal Opportunity Employer M/F

NEW MEXICO STATE UNIVERSITY

NMSU Computer Center is seeking a Programmer/Analyst II (User Consultant), effective Oct. 11, 1976. Knowledge of APL, FORTRAN, COBOL, PASCAL, SIMSCRIPT, PL/I desired. Work in a progressive environment on a 360/65 with HASP & OS/MVT. Annual Salary to $14,300. Apply to: Mgr./User Services, Box 3AT, NMSU, Las Cruces, New Mexico 88003. NMSU is an Equal Opportunity/Affirmative Action Employer.

COMPUTER PROGRAMMER/ANALYST

Analyze, design, and program a variety of systems for a two year community college. Proficiency in business areas, higher math, and statistics. B.A. Degree plus two years experience preferred. $12,500 plus benefits. Send resume to Samule W. Harbold, Manager, Data Processing Center, Corning Community College, Corning, New York 14830 by Oct. 1, 1976. C.C.C. is an equal opporty/affirmative action employer and adheres to the guidelines of Title IX.

CURRENT OPENINGS PARTIAL LIST

Project Leader (2) To $24K (N.E.) COBOL, 370/OS/VS, CICS, Inventory, Order Entry, etc., Supervisory.
Sr. Prog/Analyst. To $19.5K. (N.E.) ANSI COBOL, BAL, CICS, TOTAL & MRP. OS or ODS.
Prog/Analyst. To $18K (N.E.) ANSI COBOL, OS or DOS with 2+ yrs. consumer goods exp.
OVER 100 OPENINGS NATIONALLY.
All fees, etc., assumed by our client firms. Resume and salary to:
MEEHAN ASSOCIATES, Human Resources Consultants, 3380 Monroe Ave., Rochester, N.Y. 14618.

Systems Consultant

Expanding system's group in Technical Services Dept. of national consulting firm seeks qualified Technical Consultant to do systems and/or application work. Individual should have at least two years of D.P. experience in systems design, thorough knowledge of PL/I, storage management techniques and list processing. Experience with ASSEMBLER language and time-sharing is highly desirable, but not required.

Salary commensurate with experience, plus company paid fringe benefit package, including profit sharing and stock options. Send resume to:

CW Box 4762
797 Washington St.
Newton, Mass. 02160
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PROGRAMMER

PUBLISHING SYSTEMS

Immediate opening available with major New York City based publishing firm. State-of-the-Art Project. At least 4 years experience in both high-level & assembler languages. A decided plus is a background in data-base design & mini computers. Prefer college degree with math, engineering or computer science major.

Excellent Growth Opportunity In New Dept
Liberal Company Benefits Package.

Send resume including salary requirements, in strict confidence to:

CW Box 4763
797 Washington St.
Newton, Mass. 02160
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SYSTEM SOFTWARE ANALYSTS

Marathon Oil Company has opportunities for System Software Analysts who have experience on large scale IBM 370 Systems.

We are seeking candidates:

- Who have experience in OS/MVT, VS2R1.7 (SVS), or VS2R2 + (MVS), or any combination thereof.

OR

- Who have experience with real time systems such as INTERCOMM, IMS, or CICS.

AND

- Who are seeking high visibility in a performance-oriented environment

Interested? Pick up the phone NOW and call this number collect 419-424-0030. It will take just a few minutes of your time (we will accept calls from 8 a.m. to 4 p.m. eastern daylight time weekdays and from 1 p.m. to 4 p.m. eastern daylight time on Saturdays and Sundays.)

These positions are located in Marathon's General Office in Findlay, Ohio, and offer a salary commensurate with education and experience and a complete benefits package. (Principals only, no agencies!)

Marathon Oil Company

An Equal Opportunity Employer

COMPUTER LEASING SALES

ARE YOU: A SALESMAN with knowledge of 360/370

OR

ARE YOU: A SYSTEMS ENGINEER with knowledge of 360/370 and would like to be in Sales

GREYHOUND COMPUTER CORPORATION, the Nation's largest third party lessor is expanding their field force to provide additional coverage for their customers and prospects in the San Francisco area.

IF: You are an experienced Sales Representative we will provide you with a productive territory.

OR

IF: You are an experienced Systems Engineer we will provide the Sales Training necessary and a productive territory.

Send your resume with salary history in confidence to: Dave Hyland, Greyhound Computer Corporation, 101 Howard St., San Francisco, Calif. 94105.

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GO GREYHOUND COMPUTER

SENIOR SYSTEMS ANALYST/PROJECT LEADER

(Accounting Systems)

Belden Corporation is a $200 Million Multi Divisional, Multi Manufacturer of wire and cable products with plants located in the Mid Central and Mid Southern States. Our Corporate Computer Center located in our Geneva, Illinois (a west suburb of Chicago) headquarters is planning the installation of a 370/158 this fall running under VS 2 with data base, RJE and interactive communication facilities in place.

We are seeking a Systems Analyst with strong analytical skills in the design and implementation of accounting applications. The applicant must be knowledgeable in accounting applications, work flow and standard journal entries. A knowledge of general ledger, responsibility accounting and cost accounting is desirable.

Salary Range To $20,000 Plus Bonus. Send Resume In Full Confidence To Mr. James L. Brennan.

BELDEN

2000 S. Batavia Ave.
Geneva, IL 60134
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SYSTEMS PROGRAMMER

Blue Cross of Western Pennsylvania

has a position open in its Systems Department involving responsibility for providing technical support and consultation to application programming and data processing personnel in such areas as software development and maintenance, and hardware evaluation.

Applicants should have a minimum two year's systems programming experience in an IBM 370 OS-OS/VS environment. Telecommunications experience and a knowledge of IMS/DB-DC or CICS is also helpful, but not required.

Send resume stating work history, educational background, and present salary to:

William C. Cunningham
Personnel Department
Blue Cross
of Western Pennsylvania
One Smithfield Street
Pittsburgh, PA 15222

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SENIOR DATA PROCESSING PROFESSIONALS

Product Managers

DELTAK has several openings for experienced Senior Data Processing Specialists. We develop and market multi-media courses for the data processing industry and serve over 2,000 organizations worldwide. Our courses consist of text, audio, and video materials which are written and produced by DELTAK professionals.

Applicants for these positions should have strong writing, communications, and self-management skills, as well as in-depth knowledge of one or more of the following data processing systems or fields: CICS, IMS, Systems Analysis, OS/VS2 (MVS), JES2 and/or JES3, Distributed Processing, Mini-Computers, Data Bases, Data Communications, Structured Disciplines, or other high technology areas.

A previous background in training is not required; however, creativity, the ability to organize technical information, and strong writing skills are musts.

If you are a highly productive, top performer, DELTAK offers you the challenge to exercise your creativity in an environment which is dedicated to quality work.

If you are qualified, send a complete resume, emphasizing your technical skills and writing experience, to the attention of the Director of Product Development at:

DELTAK
O'HARE AEROSPACE CENTER
9950 W. LAWRENCE AVE. SUITE 50
SCHILLER PARK, ILLINOIS 60176

Salary will be commensurate with your talents and experience.
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PROGRAMMER ANALYST

MINI-COMPUTERS

Our newspapers need a self-motivated person who likes challenge, responsibility and decision making opportunities. You will join a newly formed software support group whose responsibilities will include systems and programming work associated with the text processing of the newspaper. Applicants should have experience on DEC PDP 11-DOS using assembler language. Experience in data management and type setting/text processing is a real plus! We offer excellent salary and benefits. If interested, send resume and salary requirements to Personnel Dept.

MINNEAPOLIS STAR AND TRIBUNE COMPANY
425 Portland Avenue
Minneapolis, MN 55488
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PROGRAMMER/ANALYSTS PROGRAMMERS

Ball State University has immediate openings for Programmers and Programmer Analysts. Thorough knowledge of COBOL program coding techniques required. Excellent fringe benefits, educational opportunities, 18 days paid vacation. Application deadline Oct. 7. Send resume and salary history to: Personnel Services Office, BALL STATE UNIVERSITY, Muncie, IN 47306. An Equal Opportunity/Affirmative Action Employer.

UNIX SYSTEMS PROGRAMMER

San Francisco Bay Area

SRI®

SRI has a unique opportunity for a Systems Programmer to assist in the development of an operational PDP/11 • 45-PDP/11 • 20 configuration.

Direct experience with DEC PDP/11 equipment and with the UNIX operating system required. Minimum 2 years related work with intelligent terminals, digital communications, and assembly languages desirable.

In addition to a wide range of benefits, SRI provides an employer paid retirement program. Please submit resume to SRI or phone Jim McDonald (415) 326-6200, Ext. 3272, 333 Ravenswood Ave., Menlo Park, CA 94025. An equal opportunity employer.

SYSTEMS ANALYST

Outstanding opportunity for self-starting, imaginative systems analyst. Will be responsible for design, development and implementation of data processing systems.

Recent reorganization has placed our emphasis on development of marketing systems, but experience in manufacturing and order entry systems also highly desirable. Candidates must have 5 years experience and be proficient in COBOL programming. Prefer college degree, but proven track record of successful accomplishments is very important.

Please send complete resume and salary requirements to Supervisor of Personnel, GTE SYLVANIA, INCORPORATED, 816 Lexington Ave., Warren, PA 06365.

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INCORPORATED
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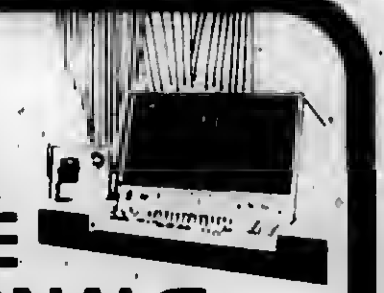

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Melbourne Florida Location

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HARRIS COMPOSITION SYSTEMS DIVISION is expanding, creating opportunities for your proven talent in a minicomputer software environment, developing operating software and real-time program modules. Become a member of a group involved with the definition and implementation of large data base DOS. With experience on PDP 11 equipment, a BS or advanced degree, and 2-5 years related experience, you are ideally qualified for a position with Harris.

FOR IMMEDIATE ATTENTION, Send your resume and salary requirements to:

Bill Schaafer

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COMMUNICATIONS AND INFORMATION HANDLING

HARRIS CORPORATION Composition Systems Division
P O Box 2080 Melbourne Florida 32901

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Senior Systems Analyst

Join GenRad's M.I.S. Department. Our computer is an IBM 370/145 with VS-1 running IMS/VS, DB/DC.

You will have project responsibility plus formulate and integrate new system concepts. You will assist in determining the economic feasibility of complex projects. A heavy manufacturing background with IMS and previous project leader experience a must. Six years of experience in systems and programming is a requirement.

GenRad, an international corporation, produces high quality instrumentation and systems for industry. Many potentials for recognition and advancement, plus an excellent benefits package, are offered with this career opportunity.

Please send your resume in confidence to our Personnel Department at
300 Baker Avenue, Concord, Mass. 01742.

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GenRad

REAL TIME PROGRAMMER/ANALYST

As one of the Midwest's leading multidivisional management and engineering consulting organizations, located 20 minutes from the University of Michigan, our steady growth requires top professionals.

Current Openings Include:

- SPC-16, PDP-11, Data General 1200.

Two Salaries, moving allowance and fully-paid fringes including life, health and dental insurances.

Call or send resume to:

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31350 Smith Road
Romulus, MI 48174
(313) 326-7010

EDP Manager

Wausau, WI. based Zimpro, Inc., a rapidly growing engineering contracting firm involved in waste water treatment, has an immediate opening for a manager of its data processing department.

MS level in computer science or equivalent experience with managerial capabilities. Knowledge of project management and engineering/contracting operations. Experience in structuring data base for real time access. Familiarity with mini-computers, preferably PDP 11-70. Experience with BASIC PLUS, COBOL, and RPG II.

Please send resume and salary requirements in strict confidence to:

Mr. Ted Stehly
ZIMPRO, INC.
Rothschild, WI 54474

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ZIMPRO

PARTNERSHIP OPPORTUNITIES

Exist with Romec and Associates, personnel consultants. Romac is expanding and seeking partners for offices to be located in Northern New Jersey, in the Southeast, in Pennsylvania, in Ohio, and in other areas. The opportunity to be an independent businessman exists for the well-motivated individual. A record of accomplishment in a data processing, sales environment could provide the experience necessary for success.

Contact H.B. Dunn, Romec & Associates, 125 High St., Boston, MA 02110 (617) 482-7748.

TECHNICIANS

We have 200 needs for I.M.S. experience alone. Also, O.S. ALC, COBOL, Mark IV, Burroughs, Honeywell, NCR. Locations depend on your skills and desires. Travel for the adventurous or regional positions for the technician who doesn't want to leave a permanent location. We have several employees who have over 5 years with us and hopefully, as our company continues to grow, new employees can benefit from working with some of the best professionals in the business. We offer diversity, continuous career growth, top dollar, travel if desired, fringe benefits. Start the ball rolling by calling or forwarding a resume.

Jerry Beatty,
Dir., Corporate Recruiting
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1-800-527-4907 toll free
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SOFTWARE ANALYSTS

As a leading innovator in the telecommunications field, GTE Automatic Electric Laboratories is developing electronic stored program controlled PCM switching systems to meet the needs of the telephone industry for modern TOLL and END OFFICE applications.

Challenging development positions are available in the areas of:

- Call handling software for real-time applications
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Requirements include a BS or MS in EE or Comp Sci and a minimum of 2 years experience in the design of on-line, real-time software (PL1 experience desirable).

Please submit a detailed resume stating salary history and requirements to:

David G. Crowley
Professional Employment
GTE AUTOMATIC ELECTRIC LABORATORIES
400 North Wolf Road, Northlake, Illinois 60164

An Equal Opportunity Employer

SYSTEMS PROGRAMMER MARKETING

Headquarters marketing organization of leading terminal equipment manufacturer needs versatile person to research large computer software, actively participate in selling and product development, and trouble-shoot application problems.

Position offers good balance of software, hardware and marketing problems. Function is young and growing.

Technical degree and systems programming experience essential. Data communications experience desirable. Limited travel.

Please send resume in confidence to J.E. Taylor, Dept. 1617-3.

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TELETYPE CORP.
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Skokie, Illinois 60076
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Computer System & Software Engineers

You can get ahead faster with us than with anybody else.

Here's why:

1 You are needed right now. Our project teams are crying for good professionals who can grab hold fast.

2 You'll get a chance to prove how good you are. Everybody is evaluated regularly; there are no missing persons at TI. If you're good, you move up fast. No matter how long the people above you have been there.

3 You'll be involved in state-of-the-art projects. Air traffic control. Satellite navigation systems. Landing systems. Radar and infra-red sensor systems. Computer-aided design. Acoustic data processing and ballistic missile defense. In addition, an Advanced Software Technology Department has been formed to develop state-of-the-art tools and procedures for computer system design and software production. TI is the technological leader in literally scores of product fields. This leadership has produced more than 5,000 patents.

4 You'll work on a complete system. No threat of getting locked into a repetitious specialty. You'll work on a small project team. You'll interface daily with other disciplines and other phases of your overall program.

5 You'll work in a job-stable, multi-market situation. We have a variety of products and markets. We're not heavily dependent on any one of them—and neither is your job...

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Computer System Engineer
M.S. or PhD in Electrical Engineering or Computer Science and five years experience in hardware and software design of real-time computer systems.

Language Processor Designers
M.S. or PhD in Computer Science and three years experience in development of programming languages, compilers, translators, assemblers and link editors.

Software System Designer
M.S. in Computer Science or Engineering and three years experience in design of software systems for real-time and interactive systems.

Programmers
B.S. in Computer Science, Math, Physics, or Engineering and programming experience with higher order languages such as Fortran, Pascal or PL/I. Both scientific and real-time programmers are required.

Openings for these positions are in Dallas, Texas. **U.S. Citizenship Required.**

Send your resume in confidence to:
Ed Haynes/P.O. Box 6015, M.S. 222/Dallas, Texas 75222.

TEXAS INSTRUMENTS
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An equal opportunity employer

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programmers

you're in demand right now . . let us show you how to make the most of it!

That's right. You're really needed as never before. So, we can show you many exceptional opportunities for increased income, promotion, challenge, and experience.

NCA are the top professionals specializing in programmer career advancement. Contact the office in your area—and move up. No charge . . . no obligation to you . . . ever!

National Computer Associates

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Elmhurst, Illinois 60126
CLEVELAND
McCormick S Associates, Inc
601 Rockwell Avenue
Cleveland, Ohio 44114
DALLAS
Data Processing Careers, Inc.
Suite 1109
Stemmons Tower West
Dallas, Texas 75207
DETROIT
Electronic Systems Personnel
1705 Fisher Building
Detroit, Michigan 48202
FLORIDA
Data Sciences Personnel, Inc.
Suite 205
15490 N. W. 7th Avenue
Miami, Florida 33188
HARTFORD
Compass, Inc.
900 Asylum Avenue
Hartford, Connecticut 06105

LOS ANGELES
TeCS, Inc.
3440 Wilshire Boulevard
Suite 1007
Los Angeles, California 90010
MINNEAPOLIS/ST. PAUL
Electronic Systems Personnel
801 Nicollet Mall, Suite 1718
Minneapolis, Minnesota 55402
NEW YORK
Botal Associates, Inc.
405 Lexington Avenue
New York, New York 10017
NORTH CAROLINA
TaskForce, Inc.
Consultants for Employment
1048 E. Wendover Ave.
P.O. Box 6888
Greensboro, North Carolina 27405
PITTSBURGH
Electronic Systems Personnel
106 Lawyers Building
428 Forbes Avenue
Pittsburgh, Pennsylvania 15218

PROVIDENCE
Xavier Associates, Inc.
10 Dorrance Street
Providence, Rhode Island 02903
SAN FRANCISCO
The Computer Resources Group Agency, Inc
303 Sacramento Street
San Francisco, California 94111
SYRACUSE
CFA Associates Personnel, Inc. (Agency)
2530 James Street
Syracuse, New York 13206
TULSA
Data Processing Careers, Inc.
Suite 10, Park 21 Building
2828 East 21st Street
Tulsa, Oklahoma 74114
WASHINGTON, D.C.
ESP Systems Corporation
Suite 210
1211 Connecticut Avenue N.W.
Washington, D.C. 20036

DEVELOPMENT MICROPROCESSOR PROGRAMMER

An immediate opening exists for an individual with a minimum of 3 years in either mini- or micro-computer basic machine language programming with at least some productive micro-computer programming experience demonstrable. Some telecommunications or computer peripheral device control is desirable. Willingness to do both analysis work and programming on a mixed basis is essential. Must have demonstrated progressive programming accomplishment.

Excellent fringe benefits.

If you are interested in a professionally challenging opportunity with a growth oriented company, send your resume and salary history to:

TOM COTTOM

CENTRONICS®
data computer corporation

Route 111
Hudson, N.H. 03051

An Equal Opportunity Employer M/F

MINI COMPUTER MAINTENANCE SPECIALIST

University Computing Services at the State University of New York at Buffalo has a vacancy for a Mini Computer Maintenance Specialist to maintain mini's and associated peripherals on the SUNY/AB campus. Candidates should have a minimum of five years experience in the maintenance of mini computers, peripherals, and digital interface circuits with at least two years trouble-shooting experience at the component level. Experience with several vendor's equipment is highly desirable. Competitive salary. Excellent fringe benefits. Elligibility for future permanent appointment. Write or call in confidence:

James Whitlock
University Computing Services
4250 Ridge Lea Road
Buffalo, N.Y. 14226
Tel: 716-831-1761

Deadline for Applications: Oct. 20, 1976 *Affirmative Action/Equal Opportunity Employer*

COMPUTER SERVICE ENGINEER

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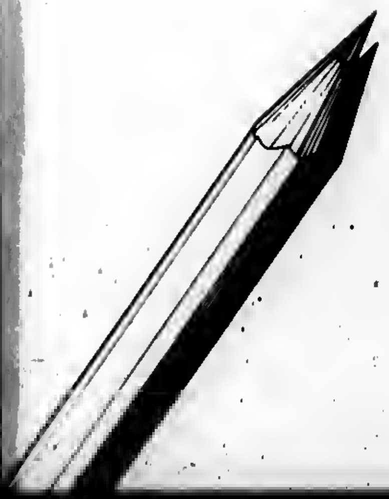

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Comten Net Rises 51% in Half

ST. PAUL, Minn. – Comten, Inc. saw its earnings rise 51% in the first six months of 1976 and 32% in the second quarter.

Second-quarter earnings totaled $313,529 or 12 cents a share compared with $238,288 or 10 cents a share in the year-ago quarter.

Revenues for the quarter rose 40% to $6.5 million compared with $4.6 million in the same quarter last year.

Six-month earnings were $440,636 or 17 cents a share, including a $189,000 tax credit, compared with $292,139 or 12 cents a share in the same period a year ago, when the tax credit was $134,000.

Revenues for the first half of 1976 were up 45% to $11.9 million from $8.2 million last year.

Comshare Year Earnings Dip Slightly

ANN ARBOR, Mich. – Comshare, Inc.'s earnings for the fourth quarter and year fell behind those of last year.

Earnings for the fourth quarter totaled $194,835 or 11 cents a share compared with $335,401 or 24 cents a share in the year-ago period. The 1975 results, however, included a tax credit of $179,000; the 1976 credit was only $10,000.

Revenues for the quarter were $3.542 million compared with $3.544 million in the comparable 1975 period.

Earnings for the year slipped to $1.2 million or 83 cents a share, including a tax credit of $452,000, compared with year-ago earnings of $1.5 million or $1.10 a share and a tax credit of $744,000.

Revenues for the year rose to $13.8 million compared with $12.3 million in 1975, the result of an approximately $3 million increase in sales of the company's data management and specialty products and services, according to T. Wallace Wrathall, vice-president of finance.

This growth, however, was offset during 1976 by a $1.5 million decline in the use of major applications by the firm's largest 1975 client, he noted.

In the last three months, Comshare announced three major transactions including the formation of an exclusive joint business relationship with Valuation Systems Corp.; an agreement to acquire the Employee Benefit Services business of Trilog Associates; and an agreement with National Data Corp. to offer cash management services on Comshare's Commander II system and distribute the services throughout the Telegrid network.

Earnings Up 44% In Sycor Quarter

ANN ARBOR, Mich. – Sycor, Inc. reported a 44% rise in its second-quarter earnings while revenues grew 32% to $17.2 million compared with the year-ago period.

Earnings totaled $1.5 million or 45 cents a share compared with $1.4 million or 48 cents a share in the same period last year.

Revenues for the year-ago period were $13.1 million.

For the first six months, earnings reached $2.8 million or 87 cents a share compared with $2.6 million or 92 cents a share in the 1975 period.

Half-year revenues rose to $33.1 million compared with $24.3 million in the comparable year-ago period.

MCI Shows $27 Million Year Loss

WASHINGTON, D.C. – MCI Communications Corp. expects revenues in its second quarter ending Sept. 30 to exceed expenses for the first time in the company's eight-year history.

For the year ended March 31, however, the firm showed a loss of $27.8 million, considerably less than the $39.3 million loss in 1975.

Revenues for the year rose to $28.4 million compared with $6.8 million in 1975.

Loss from operations totaled $12 million compared with $18.7 million last year.

Chairman William G. McGowan estimated the firm's revenues for the second quarter will be $16.7 million compared with $6.4 million in the year-ago period while expenses should be about $16.4 million.

The firm's first-quarter cash flow was a deficit of $400,000 compared with a deficit cash flow of $2.8 million in the same period last year.

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Telex First-Quarter Net Slumps

TULSA, Okla. – Telex Corp. reported a slump in both earnings and revenues for the first quarter despite a small profit by its Computer Products Group.

Earnings for the quarter were $1.1 million or 11 cents a share compared with nearly $2 million or 19 cents a share in the year-ago period.

Revenues for the period were down to $24.6 million from $27.5 million in the 1975 quarter.

In a similar trend, computer peripheral equipment lease/rental income dropped to $1.6 million in the first quarter compared with $4.2 million in the 1975 period.

Acquisitions

Technicon Corp. has agreed in principle to acquire T&T Technology, a designer and manufacturer of data acquisition and management systems, for an undisclosed amount of common stock.

Wavetek has acquired Compata, a software and systems engineering firm, through a purchase of assets.

Advanced Computer Techniques Corp. has acquired the Tucson Data Center's processing activities.

Communications Group, Inc. has acquired the Dextel Division of Computer Investors Group, Inc.

Data Communications Corp. has agreed in principle to acquire Interactive Systems Technology for an undisclosed amount.

Itel Corp. has agreed to acquire Autex, Inc. Under the terms of the agreement, 1.5 shares of Itel common stock will be exchanged for each share of Autex common, subject to stock price fluctuation.

Computer Resources, Inc., lessor and manufacturer of computer disk packs, has acquired a majority interest in Constant Data Control, a firm which performs on-site maintenance and refurbishing of disk packs and cartridges.

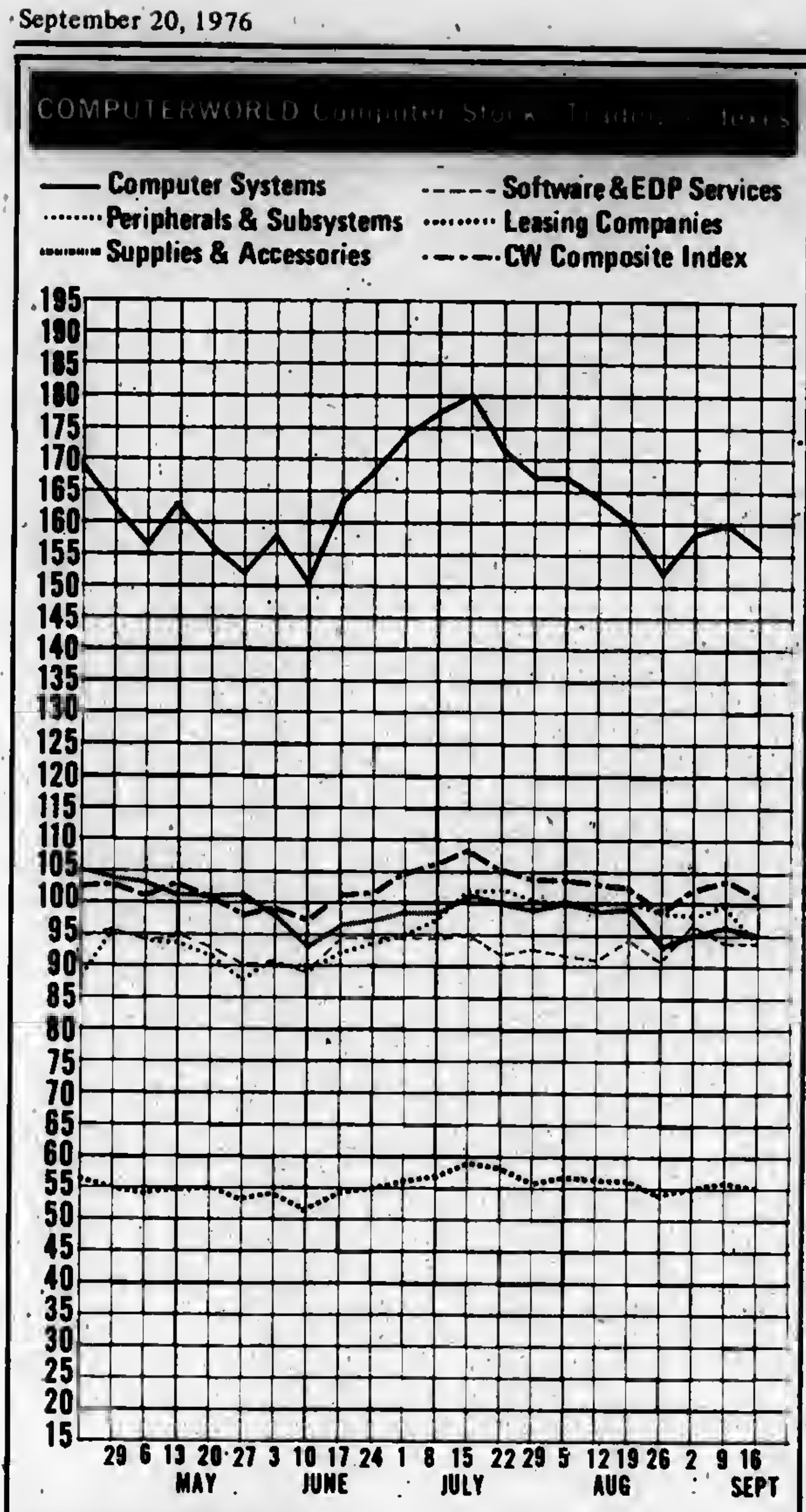
Itel Corp. has agreed in principle to acquire Computer Dimensions, Inc. Terms of the agreement call for the exchange of one share of Itel common stock for two shares of issued and outstanding Computer Dimensions common.

Computer Data Systems, Inc. has acquired Forlines and Associates, Inc., which will operate as a division.

New Registrations

ITEL CORP., Ona Embarcadero Cantar, San Francisco, Calif. 94111, a financial, transportation and data services firm, filad to registar 94,760 shares of common, issuabla upon the axarcising of its warrants exercisable at $6.25 per shara and axpiring May 1, 1978. No undarwritar is involvad.

MOOULAR COMPUTER SYSTEMS, INC., 1650 West McNab Rd., Fort Laudardale, Fla. 33309, a digital computar firm, filad to ragister 70,000 sharas of common to be offered in exchange for tha outstanding shares of ECS Information Systams, Inc. Fifty thousand shares will ba exchanged immediataly at tha rata of .0814 share for each ECS share; up to an additional 20,000 of such sharas, subject to certain conditions, will be exchanged at tha rate of .0326 shara for each ECS share. No underwritar is involvad.



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Three Months Ended May 31

	1976	1975
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Revenue	5,412,511	3,880,319
Earnings	1,054,663	762,199
6 Mo Shr	.53	.34
Revenua	10,412,402	7,149,559
Earnings	2,024,100	1,275,105

CONTROL DATA

Three Months Endad June 30

	1976 (000)	a1975 (000)
Shr Ernd	$.67	$.55
Revenue	335,135	299,375
Spac Crad	150	50
Earnings	11,597	9,323
6 Mo Shr	1.25	1.20
Revenue	641,698	581,380
Spec Cred	250	200
Earnings	21,687	20,139

a-Restated.

HONEYWELL

Three Months Ended June 30

	1976 (000)	a1975 (000)
Shr Ernd	$.86	$.51
Revanue	702,429	680,130
Spec Cred	2,232	1,190
Earnings	19,376	12,685
6 Mo Shr	1.49	.42
Revenue	1,335,984	1,282,289
Spec Cred	3,236	1,190
Earnings	32,929	13,756

a-Restated.

IBM

Three Months Endad June 30

	1976 (000)	1975 (000)
Shr Ernd	$3.94	$3.14
Revenue	4,013,514	3,496,332
Earnings	592,809	468,770
6 Mo Shr	7.57	6.09
Revenue	7,828,331	6,768,330
Earnings	1,137,194	905,993

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, SEPTEMBER 15, 1976

All statistics compiled, computed and formatted by
TRADE★QUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		1976 RANGE (1)	CLOSE SEP 15 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	84-108	91	-2 3/4	-2.9
O	COMPUTER AUTOMATION	10- 19	16	-1 3/8	-7.9
N	CONTROL DATA CORP	18- 27	23 1/4	- 1/2	-2.1
N	DATA GENERAL CORP	40- 60	45	-4 1/2	-9.0
O	DATAPOINT CORP.	24- 46	34 3/4	-3 1/4	-8.5
O	DIGITAL COMP CONTROL	2- 7	5 7/8	+ 1/2	+9.3
N	DIGITAL EQUIPMENT	138-181	159	-9 3/4	-5.7
N	ELECTRONIC ASSOC.	2- 5	2 5/8	0	0.0
A	ELECTRONIC ENGINEER.	7- 16	9 1/4	- 1/8	-1.3
A	FOXBORO	28- 47	44 3/4	- 7/8	-1.9
O	GENERAL AUTOMATION	5- 11	6 1/4	- 1/2	-7.4
O	GRI COMPUTER CORP	1- 1	3/4	+ 1/8	+20.0
N	HEWLETT-PACKARD CO	85-117	90 7/8	- 5/8	-0.6
A	HONEYWELL INC	34- 56	44 1/2	-1	-2.1
N	IBM	227-280	278 1/4	+1 1/4	+0.4
O	MANAGEMENT ASSIST	1- 3	1 5/8	0	0.0
O	MEMOREX	18- 33	26 3/4	+ 5/8	+3.1
O	MICRODATA CORP	10- 28	26 1/4	-1 1/8	-4.1
C	MODULAR COMPUTER SYS	4- 14	3 1/2	-1	-22.2
N	NCR	24- 36	35 5/8	- 5/8	-1.7
O	PRIME COMPUTER INC	4- 14	13	- 3/4	-5.4
N	PERKIN-ELMER	19- 27	22 3/4	+ 1/8	+0.5
N	RAYTHEON CO	45- 66	62 3/4	+ 3/4	+1.2
N	SPERRY RAND	40- 52	47	-1	-2.0
O	SYCOR INC	19- 31	20 1/4	-1 1/4	-5.8
A	SYSTEMS ENG. LABS	6- 10	6 7/8	- 1/2	-6.7
N	VARIAN ASSOCIATES	13- 17	13 7/8	- 3/8	-2.6
A	WANG LABS.	11- 20	16 3/4	0	0.0

LEASING COMPANIES

EXCH		1976 RANGE (1)	CLOSE SEP 15 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMDISCO INC	3- 10	7 1/2	- 1/4	-3.2
A	COMMERCE GROUP CORP	2- 3	2	- 1/8	-5.8
A	COMPUTER INVSTRS GRP	1- 3	1 5/8	0	0.0
M	DATRONIC RENTAL	0- 1	7/8	- 1/4	-22.2
A	DCL INC	1- 1	5/8	0	0.0
N	DPF INC	5- 8	7	0	0.0
N	ITEL	6- 15	12 3/4	- 5/8	-4.6
N	LEASCO CORP	6- 19	17	- 1/2	-2.8
O	LEASPAC CORP	0- 1	1/4	0	0.0
O	NRG INC	0- 1	3/8	- 1/8	-25.0
A	PIONEER TEX CORP	6- 9	7 1/4	+ 1/8	+1.7
N	U.S. LEASING	7- 12	9 1/4	- 1/4	-2.6

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

SOFTWARE & EDP SERVICES

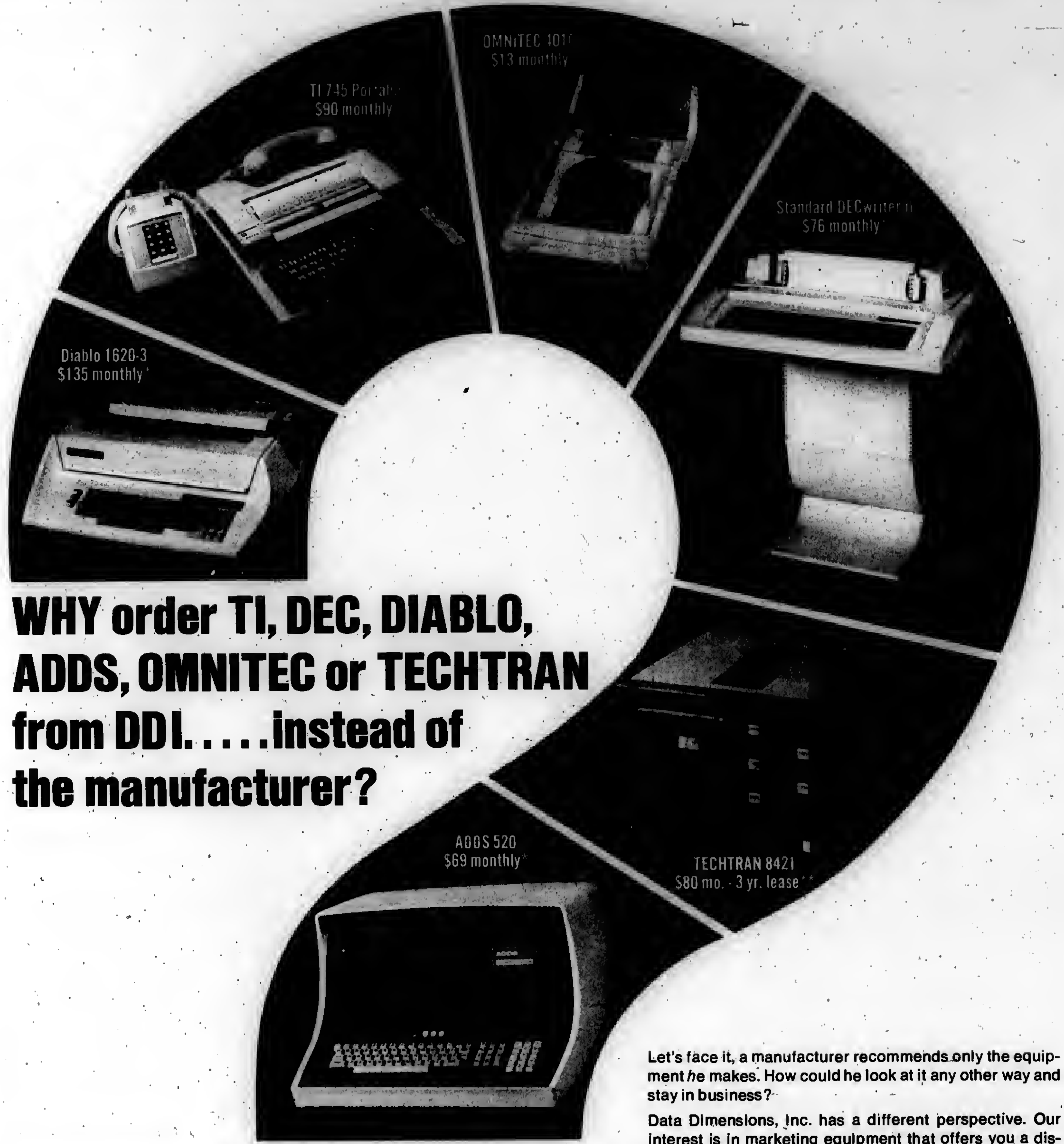
EXCH		1976 RANGE (1)	CLOSE SEP 15 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 3	1 5/8	- 1/8	-7.1
O	ANACOMP INC	6- 11	6 7/8	+ 3/4	+12.2
A	APPLIED DATA RES.	2- 4	3 1/4	- 1/4	-7.1
N	AUTOMATIC DATA PROC	17- 35	31 1/8	+ 1/8	+0.4
O	COLEMAN AMERICAN COS	2- 6	2 1/2	- 1/8	-4.7
O	COMPUTER DIMENSIONS	3- 7	5 1/4	0	0.0
O	COMP ELECTION SYSTMS	5- 9	6 3/4	+ 1/2	+8.0
O	COMPUTER HORIZONS	1- 2	1 1/2	0	0.0
O	COMPUTER NETWORK	2- 6	4 3/8	+ 3/4	+20.6
N	COMPUTER SCIENCES	4- 8	6 1/4	0	0.0
O	COMPUTER TASK GROUP	1- 1	1	0	0.0
O	COMPUTER USAGE	3- 6	3	0	0.0
C	COMSHARE	2- 9	5 1/4	- 1/2	-8.6
O	DATA DIMENSIONS INC	2- 4	2 5/8	- 1/8	-4.5
O	DATATAB	1- 1	1 3/8	0	0.0
N	ELECTRONIC DATA SYS.	12- 18	15 5/8	0	0.0
C	INFONATIONAL INC	1- 1	1/8	0	0.0
O	INSYTE CORP	1- 3	1 3/4	0	0.0
C	IPS COMPUTER MARKET.	1- 2	1 1/8	0	0.0
O	KEANE ASSOCIATES	2- 4	2 1/4	- 3/8	-14.2
O	KEYDATA CORP	2- 5	1 7/8	0	0.0
C	LOGICON	3- 4	3 3/8	- 1/8	-3.5
A	MANAGEMENT DATA	1- 3	2	0	0.0
A	NATIONAL CSS INC	13- 25	21 1/8	- 1/4	-1.1
A	ON LINE SYSTEMS INC	18- 22	20	- 1/4	-1.2
N	PLANNING RESEARCH	3- 5	3 5/8	0	0.0
O	PROGRAMMING & SYS	1- 1	3/8	0	0.0
O	RAPIDATA INC	2- 5	2 1/8	- 1/4	-10.5
O	REYNOLDS & REYNOLDS	13- 21	15	-1	-6.2
O	SCIENTIFIC COMPUTERS	1- 1	1	+ 1/8	+14.2
O	TYMSHARE INC	19- 28	25 1/2	- 5/8	-2.3
A	URS SYSTEMS	3- 5	3 1/2	+ 1/8	+3.7
N	WYLY CORP	2- 7	1 5/8	0	0.0

PERIPHERALS & SUBSYSTEMS

EXCH		1976 RANGE (1)	CLOSE SEP 15 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	8- 13	8 7/8	- 1/8	-1.3
O	ADVANCED MEMORY SYS	4- 10	6 3/8	- 1/2	-7.2
N	AMPEX CORP	5- 10	7	- 1/4	-3.4
O	ANDERSON JACOBSON	2- 4	3	+ 1/8	+4.3
C	APPLIED DIG DATA SYS	13- 25	18 3/4	- 1/2	-2.5
O	BEEHIVE MEDICAL ELEC	3- 9	8 3/4	+ 1/8	+1.4
A	BOLT.BERANEK & NEW	7- 11	8	- 1/2	-5.8
N	BUNKER-RAMO	5- 10	7 7/8	0	0.0
A	CALCOMP	4- 7	4 1/4	- 5/8	-12.8
O	CAMBRIDGE MEMORIES	0- 6	1/2	- 1/8	-20.0
N	CENTRONICS DATA COMP	20- 36	34 1/4	+2 5/8	+8.3
C	CODEX CORP	22- 42	36	-1	-2.7
C	COGNITRONICS	1- 1	7/8	0	0.0
O	COMPUTER COMMUN.	1- 6	5 3/4	+ 1/2	+9.5
O	COMPUTER CONSOLES	4- 7	5	- 3/4	-13.0
A	COMPUTER EQUIPMENT	1- 3	1 3/4	+ 1/8	+7.6
C	COMPUTER TRANSCEIVER	1- 3	7/8	0	0.0
C	COMTEN	4- 9	8 1/4	+ 5/8	+8.1
N	CONRAC CORP	20- 25	21 5/8	- 1/8	-0.5
O	DATA ACCESS SYSTEMS	1- 4	4 1/4	+ 1/2	+13.3
O	DATA 100	7- 13	8 3/8	- 5/8	-6.9
A	DATA PRODUCTS CORP	5- 15	12 3/8	- 5/8	-4.8
O	DATA TECHNOLOGY	1- 2	1 1/2	- 1/8	-7.6
O	DATUM INC	1- 2	1 3/8	0	0.0
O	DECISION DATA COMPUT	1- 4	1 1/2	- 1/8	-7.6
O	DELTA DATA SYSTEMS	1- 1	1	- 1/4	-20.0
N	ELECTRONIC M & M	1- 4	3 1/8	- 1/2	-13.7
O	FABRI-TEK	1- 1	3/4	- 1/8	-14.2
O	GENERAL COMPUTER SYS	1- 2	1	0	0.0
N	HAZELTINE CORP	4- 12	8 1/2	- 3/8	-4.2
N	HARRIS CORP	34- 55	53 1/4	-1 1/8	-2.0
A	INCOTERM CORP	9- 20	11 3/8	+1	+9.6
O	INFOREX INC	3- 7	3 7/8	- 3/8	-8.8
O	INFORMATION INTL INC	10- 18	11 1/2	+ 1/4	+2.2
O	INTEL CORP	59-109	65	+ 1/2	+0.7
A	LUNDY ELECTRONICS	3- 7	3 1/4	0	0.0
O	MSI DATA CORP	3- 7	6	- 1/4	-4.0
A	MILGO ELECTRONICS	15- 21	16 5/8	- 1/8	-0.7
N	MOHAWK DATA SCI	3- 10	6 7/8	- 1/8	-1.7
O	PENRIL CORP	1- 3	2	0	0.0
A	PERTEC CORP	3- 8	6 7/8	- 1/2	-6.7
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	5- 10	4	0	0.0
O	QUANTOR CORP	4- 6	4 1/8	0	0.0
O	RECOGNITION EQUIP	6- 11	7 1/2	0	0.0
N	SANDERS ASSOCIATES	6- 11	8 3/4	-0	0.0
O	SCAN DATA	2- 4	1 7/8	- 1/8	-6.2
O	STORAGE TECHNOLOGY	9- 13	11 1/4	- 3/4	-6.2
O	T BAR INC	5- 10	5 7/8	+ 1/8	+2.1
O	TALLY CORP.	4- 6	4 1/4	- 1/8	-2.8
O	TEC INC	3- 6	5 1/4	-1	-16.0
N	TEKTRONIX INC	45- 67	61 1/4	+1 1/2	+2.5
N	TELEX	2- 5	3	0	0.0
O	WANGCO INC	11- 22	21 1/8	0	0.0
O	WILTEK INC	2- 2	2 1/8	+ 1/8	+6.2

SUPPLIES & ACCESSORIES

EXCH		1976 RANGE (1)	CLOSE SEP 15 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED SYSTEMS INC	1- 4	3 1/4	0	0.0
O	BALTIMORE BUS FORMS	3- 5	2 1/2	- 1/4	-9.0
A	BARRY WRIGHT	6- 10	7 1/2	- 1/4	-3.2
O	CYBERMATICS INC	1- 1	1/2	0	0.0
A	DATA DOCUMENTS	25- 42	31	+2 1/4	+7.8
C	DUPLEX PRODUCTS INC	13- 24	13 5/8	+ 1/4	+1.8
A	ENNIS BUS. FORMS	6- 8	6 1/4	- 1/8	-1.9
O	GRAHAM MAGNETICS	8- 13	9 1/4	- 1/4	-2.6
C	GRAPHIC CONTROLS	13- 19	15	0	0.0
N	3M COMPANY	53- 65	62 3/4	-1	-1.5
C	MOORE CORP LTD	36- 51	35 3/4	-2 1/2	-6.5
N	NASHUA CORP	11- 18	16 1/2	0	0.0
O	STANDARD REGISTER	15- 19	15 3/4	+ 1/4	+1.6
C	TAB PRODUCTS CO	5- 11	10 1/4	+1 1/4	+13.8
N	VARCO	20- 25	19 7/8	- 1/8	-0.6
A	WABASH MAGNETICS	4- 8	7 1/8	- 1/2	-6.5
N	WALLACE BUS FORMS	19- 25	21	+ 3/4	+3.7



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NEWSPAPER

Bell Low-Speed Modems Not Pacesetters

The Consumer Communications Reform Act of 1976, now pending before Congress, seeks to effectively eliminate competition within the telephone industry. One premise of the proposed legislation is that competition in communications has been detrimental.

This article is the second of two which examine the area of data communications equipment and the major product contributions made by independent competitors.

By Ronald A. Frank
Of the CW Staff

The emergence of independent suppliers into the low-speed data communications area in the early '70s spurred Bell to react with similar products.

The low-speed modem area is generally characterized by devices operating at 300-, 1,200- and 2,400 bit/sec. As independent suppliers began offering this type of modem, they typically provided users with more features at lower cost than comparable Bell data sets.

The additional features of the independent suppliers included diagnostic capabilities which allowed the user to test the line and modems to determine whether they were working correctly.

The Bell 103 modem was the workhorse of the 300 bit/sec area, but, beginning in 1970, the independent models offered improved performance. In order to counter the impact of the less expensive independent modems, Bell cut the price of its already-installed 103s.

In late 1970, Bell companies offered to convert the 103A from an originate/answer to an originate-only device. This conversion involved sending a Bell maintenance man to a customer site to disable part of the modem's features. The "new" modem then cost the user $10/mo instead of $25/mo.

The independent suppliers said the lower price meant Bell was

(Continued on Page 8)

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French in Quandry As Sicob Opens

By E. Drake Lundell Jr.
Of the CW Staff

PARIS – Governmental support for the French computer industry was in question here last week at the Salon International de l'Informatique de la Communication et de l'Organisation du Bureau (Sicob).

The night before the huge show opened, the French government announced an austerity program aimed at clamping down on inflation that has grown 12% this year.

The austerity program, announced by Prime Minister Raymond Barre, called for a cut in government spending to balance the budget, a temporary price freeze and wage guidelines. As Sicob opened, users and industry representatives alike were waiting for clarification of future funding plans for the French computer industry.

The government previously had supported a two-pronged approach. First, it practiced selective purchasing practices that aided the French industry and provided direct support to the firms. The second program involved

(Continued on Page 8)

IBM Cuts Prices 25% On Data Entry Gear

By Esther Surden
Of the CW Staff

ATLANTA – IBM last week made 25% cuts, effective immediately, in the purchase prices of key data entry equipment in its General Systems Division (GSD).

The reductions include price cuts on most features of the Model 3741 data station/programmable workstation.

The cost of some communications features on the 3741, which uses floppy disks, were not reduced, an IBM spokesman noted.

Of the 51 machine types affected by the reductions, 13 are active products. The remainder have already been removed from rental and maintenance lists or will be removed from those lists in the future in accordance with past IBM announcements.

Rental and maintenance prices were not affected by the reduction announcement, the spokesman emphasized.

The price reductions, which cover such

(Continued on Page 4)

After 11-Month Suspension

New York Antes Up Revamped Lottery

By John P. Hebert
Of the CW Staff

ALBANY, N.Y. – New York State introduced a brand new instant lottery called "Empire Stakes" here this month, 11 months after the discovery of duplicate ticket numbers forced the old lottery to close down.

Gov. Hugh Carey's suspension of the games last October was followed by a study which revealed a programming error that caused the duplicate ticket numbers was only one of many problems in the state's lottery system [CW, Dec. 10].

Arthur D. Little, Inc. (ADL), author of the study, described the weekly games as "poorly designed, implemented, controlled and managed." The DP operation was hit hard by the ADL report.

The lottery commission was disbanded, 325 employees were suspended and a new effort was begun.

The DP functions have since been consolidated and made a division of the lottery commission itself. The lottery has been placed under the state's Department of Taxation and Finance Commission, according to Vincent Monitto, Director of Lottery Systems and Game Development. John D. Quinn, who successfully administered Michigan's lottery, now heads New York's reorganized lottery program.

The new games are being implemented in phases, according to a spokeswoman. Phase I, scheduled to run until early November, was designed by Scientific Games Development Corp. of Atlanta, she said.

Players learn if they are winners by scratching off the wax coating from six boxes on each game ticket. Each box contains a dollar amount or the word "jackpot," the spokeswoman said.

If the amounts are the same in three boxes, the player wins that amount. If all six boxes contain the word "jackpot," the player wins $5,000, plus a 24 million-to-one chance to win $1,000/week at a ticket drawing, she explained.

The first drawing is expected to take place in mid-October, she noted.

A weekly game designed by Mathematica, Inc. will be phased-in sometime in November. In early January, an instant game will be resumed, followed by the operation of both games simultaneously,

(Continued on Page 4)

Carter Camp Using Terminals To Track Expenses, Opinion Data

By John P. Hebert
Of the CW Staff

ATLANTA – Both Gerald Ford and Jimmy Carter are relying on computer systems to efficiently reach large segments of the population in hopes of winning the November Presidential election.

But although both candidates are utilizing DP systems, they are using the technology in different ways and for different purposes.

Ford/Dole supporters are relying on the National Republican Congressional Committee (NRCC) to buy time on larger number- and name-crunching systems for a national telephone campaign involving 35 million to 40 million registered voters [CW, Sept. 13].

The Democratic camp, meanwhile, is putting $2,000/mo of its total $22 million federal campaign allowance toward on-site computer terminals tied into a national time-sharing service. Part of this allotment is also going toward an information service and the use of a local service bureau's mainframe, according to Steve Slade, chief systems analyst for the Carter Presidential campaign.

The terminals, which include three General Electric Co. (GE) Terminet 300s, a Hazeltine Corp. 2000 CRT, one GE Terminet 1200 char./sec printer and an APL language portable terminal, are located at campaign headquarters here, Slade said.

There are four additional terminals aboard Carter's and Mondale's leased United Airlines planes two GE Terminet 300s as primaries and two Texas Instruments Silent 700s as backups connected to five 300 bit/sec dial-up phone lines while on the ground

All of these communications-oriented devices are intended for use in two areas, Slade said.

The first is a business application based on the GE Mark III remote time-sharing service utilizing GE's Data Management System (DMS) for financial reporting and

(Continued on Page 2)

FEC Unveils Turnkey System To Monitor Campaign Dollars

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. – The Federal Election Commission (FEC) unveiled the computer system here last week that will monitor federal campaign spending, beginning with the Presidential election this November.

For the first time, this multivendor system will make available to the commission and the public summaries and analyses of the money flow in national politics before an election occurs, according to FEC Chairman Vernon W. Thompson.

"In the past," he noted, "this kind of data was developed only long after the elections were over."

Not only will the system help keep candidates and their contributors honest by assisting the FEC in its audit and enforcement tasks, but it will be of "invaluable assistance" in hastening public disclosure of campaign finance information, Thompson added.

The commission plans to provide printouts of information contained in the system on a regular basis. In addition, the FEC will maintain a terminal that can be used by the public and the press as a research tool for selective inquiry of particular information in its Public Records Office, located here at 1325 K St. N.W., the commissioner stated. All of these services will be available at no charge.

(Continued on Page 8)

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Navy Sources Say Maybe

F-14 Dip in Drink Caused by DP Failure?

By John P. Hebert
Of the CW Staff

WASHINGTON, D.C. – The U.S. Navy's top-secret F-14 Tomcat jet fighter which plunged into the Atlantic Ocean 75 miles west of Scotland two weeks ago may have been lost because a malfunctioning computer system caused one of the plane's two engines to race out of control, Navy sources said here last week.

They stressed, however, that the Navy is holding all judgments until the plane is recovered and examined for the exact cause of the accident.

The $14.3 million F-14, equipped with advanced computer and electronic navigational and weapons systems, missed the catapault of the carrier John F. Kennedy and hit the water beyond the flight deck at a speed of about 50 knots, the Navy sources said.

The plane's two pilots were ejected from the cockpit and landed on the carrier deck relatively unharmed, one source said.

The fully-deployed F-14 sank with a $500,000 Phoenix missile system, an automated multiple-target and simultaneous guidance missile system, an automated system for immunity to electronic countermeasures and a communications control system for pilotless operation.

When asked whether these were controlled by sophisticated computer systems, the spokesman said he imagined a man could not do these things.

The significance of the accident was heightened by confirmation late last week of reports from the *Washington Post* that a Soviet ship was shadowing the John F. Kennedy and remained in the immediate vicinity of the crash.

However, the Navy had no comment on whether it was attempting to retrieve the plane to prevent a Russian recovery and subsequent examination of the electronics or armament systems on board.

The Navy began recovery attempts last week because the F-14 is a "very valuable aircraft and to see what caused the accident. We want the entire package back," the spokesman stressed.

The search for the craft will utilize sidescan sonar and a navigation system for ocean-bottom triangulation of fixed points. Both location methods are necessary because of possible strong currents.

Terminals in Carter Camp Tracking Expenses

(Continued from Page 1)

expense itemization, he noted.

Data on campaign expenditures, including money spent for political advertisements, employee payroll, candidates' and campaign workers' expense accounts, telephone charges and travel expenses, are keyed into the DMS through the terminals, Slade said.

With nationwide bank accounts containing funds acquired during the Presidential primaries earlier this year and a payee list with 6,000 accounts, Carter's campaign organizers knew they would need – and planned for computer terminals, Slade said.

In addition, the campaigners are required by law to report all expenditures to the Federal Election Commission (FEC) and itemize amounts over $100, he added.

The FEC also required reports of income gained during the primaries to allocate federal matching funds, Slade said.

Information Sources

The second application is for communications utilizing information sources such as a public opinion research service in Cambridge, Mass., and the *New York Times* Information Bank.

One terminal, the Hazeltine 2000, is devoted to gathering information from the *New York Times* service at 1,200 bit/sec transmission speeds over dial-up telephone lines, Slade said.

But "the airplanes present unique stress problems for computer terminals," he said, citing reasons for the backup terminals.

The units on the planes are used for communications with campaign headquarters, itinerary scheduling, speech editing, political reports, press information and tracking flight charges accumulated by the press and Secret Service, Slade said.

Bills for plane fare are printed for the Secret Service and members of the press traveling with Carter and Mondale, and a general ledger of these transactions is updated on the DMS data base for FEC reporting, he added.

The FEC reports, Slade commented, would be "a prohibitive task to do manually."

Early in the campaign, Carter administrators "thought it wise to do the work with computers. They know how to get good results out of computers. It's a tool they think can be put to good use," Slade explained.

A third application involves an Atlanta-based service bureau which has an IBM 360, Slade said. On a weekly basis, this system collates mailing lists from letters received from prospective Carter and Mondale supporters.

When campaign headquarters gets the names of possible supporters, letters of response are sent to these people asking for volunteer work during the campaign.

The names are also sent to a Carter worker in the field who contacts the letter writers by telephone for the same reason, Slade noted.

At the end of each week, a list which provides names and addresses of prospective volunteers is sent to the service bureau to be sorted by state and Zip Code, he said.

The "Zip sort" is actually a cities sort, enabling the Carter/Mondale workers to coordinate the search for volunteers, he said.

The service bureau also maintains a mailing list for printing name and address labels for political mail sent on a regular basis to sympathetic elected officials and media organizations, Slade added.

The emphasis on computer terminals and systems is intended to hold the line on campaign costs by maintaining tight books. "We want to make sure we don't spend the $22 million in the first three weeks," Slade explained.

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8	Gulf Oil
9	General Electric
10	Chrysler
11	International Tel. & Tel.
12	Standard Oil (Ind.)
13	U.S. Steel
14	Shell Oil
15	Atlantic Richfield
16	Continental Oil
17	E. I. du Pont de Nemours
18	Western Electric
19	Proctor & Gamble
20	Westinghouse Electric
21	Union Carbide
22	Tenneco
23	Goodyear Tire & Rubber
24	International Harvester
25	Occidental Petroleum
26	Phillips Petroleum
27	Union Oil of California
28	Bethlehem Steel
29	Caterpillar Tractor
30	Eastman Kodak
31	Rockwell International
32	Dow Chemical
33	Kraftco
34	RCA
35	Esmark
36	Sun Oil
37	LTV
38	Beatrice Foods
39	Xerox
40	United Technologies
41	Greyhound
42	Firestone Tire & Rubber
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Food Marts Called Not Immune to Hardware Threats

By Toni Wiseman
Of the CW Staff

DENVER – Supermarkets are no less susceptible to hardware catastrophes than any other business, Edward Devlin told the Super Market Institute's (SMI) annual DP conference last week.

"You may not be getting bomb threats in your installations because you are in a low profile industry – food – but don't think it couldn't happen, because it has," the senior partner of Devlin Associates said to startle attendees into thinking about disaster recovery plans.

"Everyday you have frequent short-term problems, such as software bugs or hardware failures or even power outages. Here the DP manager should have latitude to do his own thing," Devlin said.

"But what about the long-term problem? That's the kind of thing you have to prepare for and prepare for now," Devlin added.

Man-made disasters are more frequent than natural ones, though even man-made ones are less frequent now than in the past when dissidents were bombing computer installations, he noted.

The possibility of a fire starting in a DP center is something like 10^2 and of a plane landing on the center is 10^4, but these disasters have occurred and every installation should have a documented recovery plan which is available for training review and updating, he maintained.

Disaster Recovery Plans

"Industry is creating the need for disaster recovery plans," Devlin asserted. "The DP manager now tells his management what will happen tomorrow and next year. The corporation is totally dependent on you."

Suppose, he suggested, a user's computer center was destroyed, the building became inaccessible and remained so for a whole week and a number of the third-shift operators were injured during the disaster.

How would the user notify everyone? Reconstruct the data? Continue temporary processing over an extended period of time? Rebuild and/or reequip his data center? he asked.

"If you can answer these four questions, you have a disaster recovery plan," Devlin told attendees.

The plan must determine who will be notified, by whom and how, he said. "It's no good to say someone will be responsible for all notification if that person was one of those injured."

User departments may have to supply data to reconstruct lost files and will certainly need to be alerted that processing may be delayed, he said. Restoring and reconstructing data is a critical area, he noted.

"Hopefully all critical files are backed up off-site, so restoring from backup tapes to disks is not a difficult task. But what about reconstructing lost data?" he asked.

Many centers operate on a son/father/grandfather system, usually with the son and father files on site and the grandfather files off-site.

"If the user department is in the same building as your DP center, you may not be able to get the hard copy you need to reconstruct your files, so what do you do then?" he queried.

CW
At SMI

"And," Devlin added, "before you can start processing current data, you've got to reconstruct all the past data. How much processing time can you get at your backup site for reconstruction before you fall hopelessly behind in current processing?"

"Multiple backup sites may be necessary and that isn't easy," he said.

Management must then decide which are its critical applications, what supplies are needed to process them and how transportation support will be coordinated, Devlin averred.

"For every application, you have to ask yourself if you can rebuild it from what you have stored off-site. This means you have to know every possible input and where it comes from," he said.

Finally, there is the area of the new data center. A disaster recovery plan should include space requirements, including space for tape libraries, programmers and supplies; power needs; air conditioning, heat and humidity controls; communications; and furniture, supplies and equipment requirements, he stated.

New York Resumes Lottery With Revamped DP

(Continued from Page 1)

the spokeswoman said.

The state lost about $27.1 million as a result of the halt in lottery operations in its 1975-1976 fiscal year and another comparable amount predicted for the first half of the 1977 fiscal year, a spokesman for the governor said.

In order to get started with the least amount of delay, the lottery commission bought time from the state's Office of General Service's Computer Division, according to Monitto.

A 2M-byte IBM 370/168 CPU is utilized there for all ticket accounting and management reporting functions.

This system, however, is not being used to print the algorithm-generated six-digit numbers that caused the lottery's problems last year, he noted.

Instead, the lottery commission is presently playing it safe, using simple dollar amounts or the word "jackpot" in each box, according to Monitto.

The weekly game with computer-generated numbers, slated to begin in November, will be heavily supervised. "All kinds of precautions have been taken," the spokeswoman stressed.

At the end of last week, the lottery commission had not released information concerning the design of the algorithm used to specify numbers printed on tickets or the number of digits for the future weekly games, she said.

The next step will be to acquire a CPU solely for the use of the lottery in keeping with the reorganization plan suggested by the ADL study, Monitto said.

That in-house system will generate numerical ticket control information, including ticket numbers and dates, on magnetic tapes, he said.

The tapes will be manually carried to two Mohawk Data Sciences Corp. MDS 2400 systems for the printing of numbers on lottery tickets from ticket stock presently supplied and designed by Moore Business Forms, Inc., he explained.

The biggest job the system will have to handle will be printing the weekly lottery tickets – a job that is expected to take 10 to 12 hours each day on the two MDS systems, he remarked.

The lottery is in a trial period from system start-up until the end of the state fiscal year next March, he said.

It has to net $60 million to break even on the budget amount allocated by the state, Monitto said.

In its first week of operation, the lottery commission sold 18.9 million tickets, setting a national record. "It looks like we'll make it without any trouble," Monitto said.

The state Bureau of the Budget will be "keeping an eye on" the lottery computer system through its DP unit, an office empowered to supervise all DP and computer processing statewide, Monitto noted.

The lottery's overseers are in the process of arranging for construction of a new facility here to house the game's 200 employees and the DP system under one roof, Monitto said.

Construction will begin after the present CPU procurement effort is completed.

IBM Data Entry Gear Reduced

(Continued from Page 1)

equipment as punch card units, control units, printers, keyboards, verifiers, data stations and arithmetic units, were the result of "a normal business review" prompted by "current economic trends," he said.

There were no "technological implications in this announcement," he added.

Active products reduced in price were the 026 interpreting card punch, 029 card punch, 047 tape-to-card printing punch, 059 card verifier, 129 card data recorder, 545 output punch, 1058 printing card punch, 2495 tape cartridge reader, 3715 printer, 3717 printer, 3741 data station, 3742 dual data station and 3747 data converter.

Of the active products, only the 3700 series models are in new production, the spokesman added. The other equipment is supplied "as new" and may be reconditioned from units turned in by users.

Representative of the price cuts are the 029 Model A-22 card punch, which was $3,685 and now costs $2,765; the 129 Model 001 data recorder, which was priced at $6,485 and now costs $4,865; the 3741 Model 001 data station, which cost $6,235 and is now priced at $4,680; the 3742 Model 001 dual data station, which sold at $7,225 and now costs $5,420; and the 3741, which was reduced from $19,330 to $14,500.

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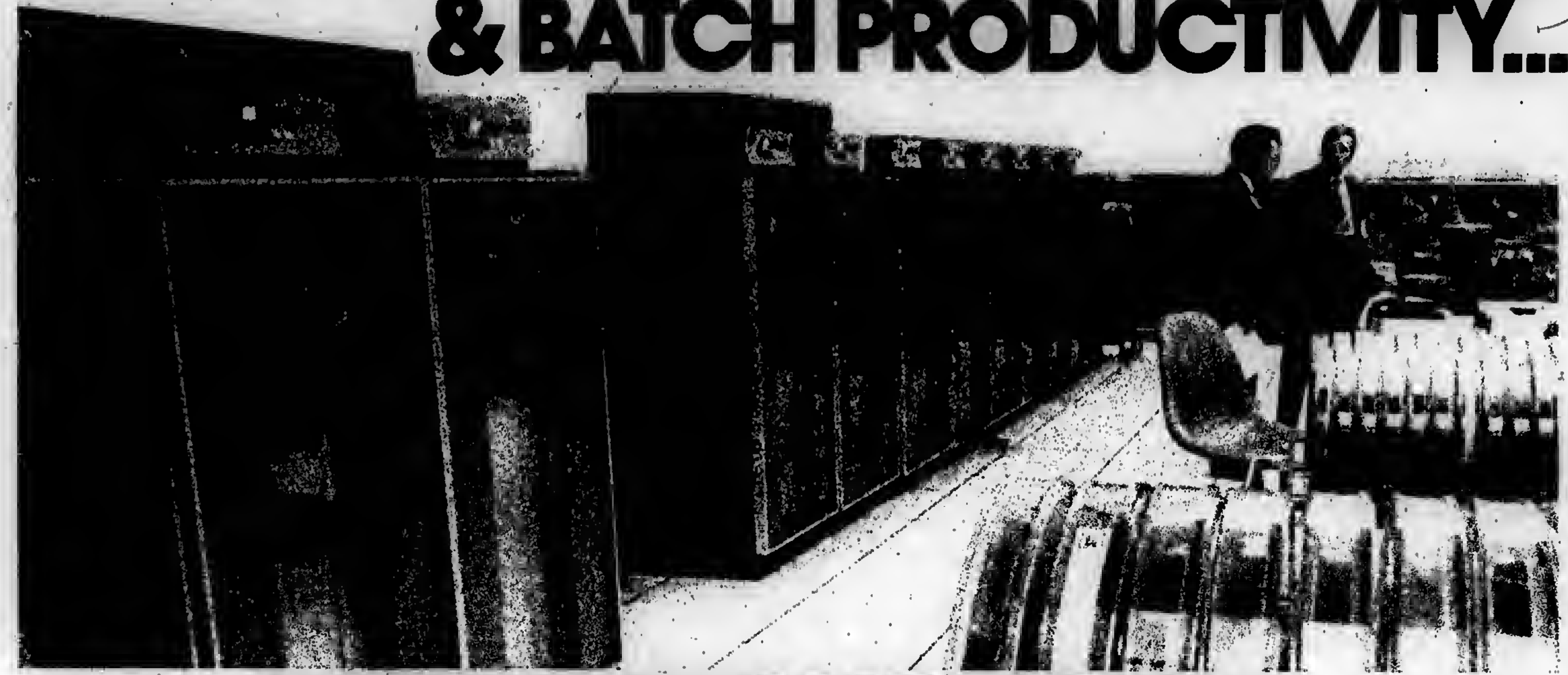

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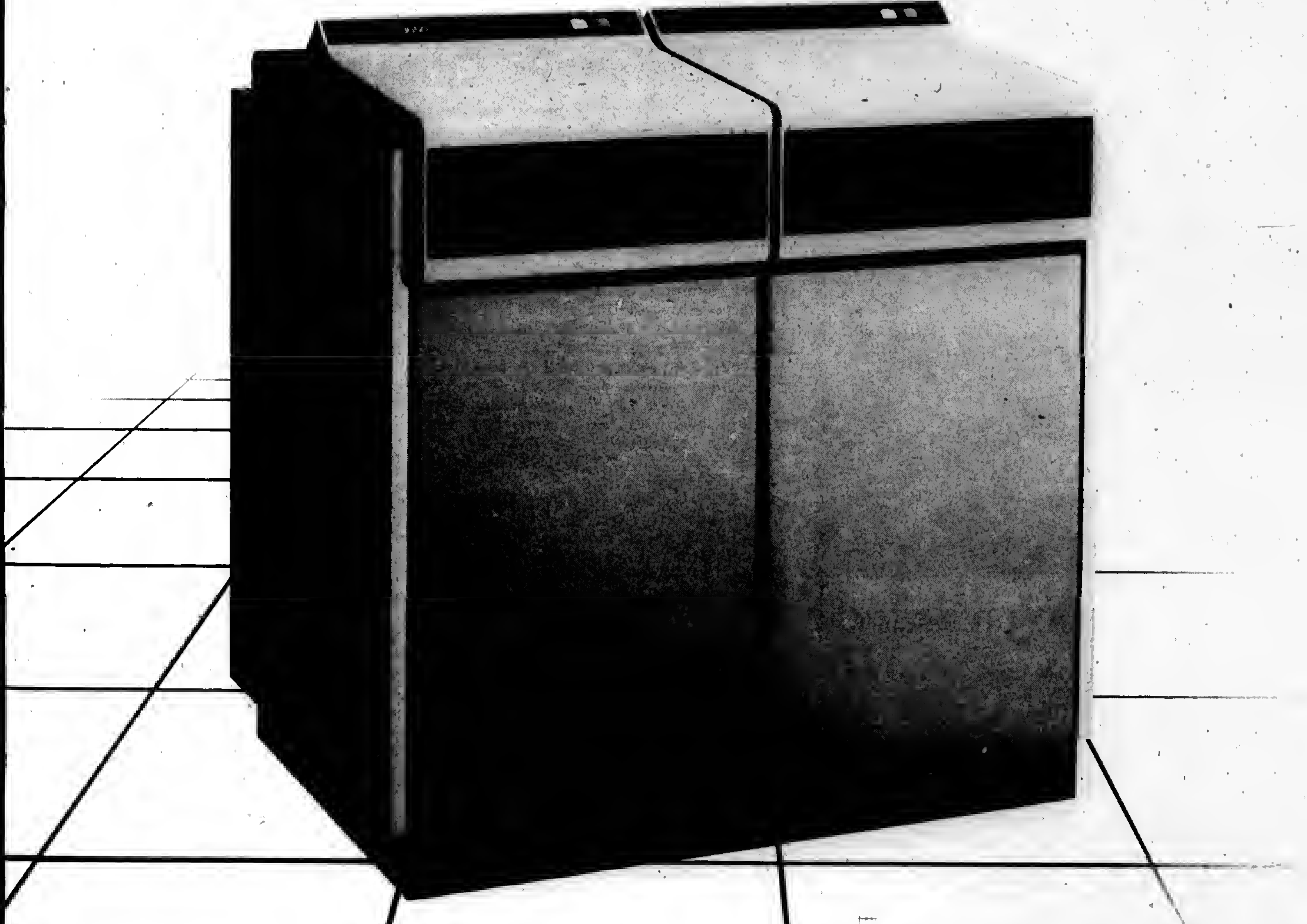

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Bell System Not Pacesetter in Low-Speed Modem Area

(Continued from Page 1)

offering the 103 below cost strictly as a reaction to its competitors.

The price on the 103 was made permanent in 1971, when Bell installed the first 113 data sets. The 113 was considered the first major modem meant to react to independent data sets.

One serious problem with the 103 was that it had no "port security" feature. This meant that during a disconnect sequence, it was possible for a second modem to connect to a line before the first modem had "timed out."

Since much of the 300 bit/sec data traffic involved time-sharing operations, this 103 deficiency meant unauthorized third parties could access computers, perhaps without the owners' knowledge.

Although the 103 is no longer generally available, this deficiency was never corrected and is also technically possible in the newer 113, according to an industry expert. The independent modems provide intelligence and logic so this problem cannot occur.

1,200 Bit/Sec Area

In the 1,200 bit/sec area, the independents offered features that improved on the Bell 201A dial-up data set and 201B private-line data set. Several independent modems could operate on both dial-up and private lines and Bell later offered the 201C, which also had this dual capability.

Bell reacted to the 1,200 bit/sec modems of the independents by bringing out a series of LSI versions in 1974 to replace its earlier 202 modems. The LSI models were smaller, less costly to build and offered some of the test indicators pioneered by the independents.

Early in 1973, Vadic Corp. began to install a modem that allowed full-duplex operation over two-wire facilities at 1,200 bit/sec. This modem, the first to offer users a full-duplex (two-way) transmission capability over only two wires, let users move the same amount of data over half the number of lines previously required.

This feature, introduced in the Vadic VA3400, is still not available from the Bell System today. After the Vadic introduction, Bell said it was working on a similar modem at Bell Laboratories, and an early version was reportedly shown to prospective customers but not introduced.

The Vadic modem suggested the possibility that the Bell System could supply customers with equipment not provided by Western Electric, its manufacturing affiliate. AT&T took some steps in this direction more than a year ago when it set up its General Trades and Purchased Products groups.

Each independent supplier admits these Bell groups have evaluated several of their modems for possible Bell System use. Beyond this evaluation process, however, Bell has yet to sign a major contract for an independent supplier to provide data sets to a Bell System company.

Most of the independents would welcome such an opportunity; several spokesmen have freely admitted they would be pleased to make modifications to their equipment if this were necessary to gain acceptance by the Bell System. Although some independents have supplied modems to independent (non-Bell System) telephone companies, AT&T has yet to approve such devices.

The evolution of 2,400 bit/sec modems covered the same type of pattern as the lower speed devices, but Bell has not reacted with a new series in the area.

Independent 'Firsts'

In all cases where Bell introduced modems to react to the independent suppliers, the modems offered features that first appeared elsewhere. The trend toward giving the customer more test capability – and thus greater control – over his data communications system was introduced by the independents. This led to decreased dependence on Bell maintenance men to solve problems and probably increased the amount of time modems and lines were operational.

The independents also were first to offer users the ability to test multiple modem locations on multipoint private-line networks. With this capability, testing could be done at many sites without having an operator at each location.

A third feature was the sharing of terminal devices. This made it possible for several terminals to share one modem. Bell did not offer this until less than a year ago.

Another area in which the independents broke ground was the use of modem-type line adapters which allow users to transmit data over wires without going through telephone company central office facilities. General Electric reportedly pioneered this type of device, but other early suppliers were Computer Transmission Corp., Prentice Electronics and Gandalf Data Communications Ltd.

These line adapters allowed users to transmit data over so-called metallic wire connections. While Bell has never offered this type of device, it has issued specifications that detail the kind of electrical signals that can be sent over metallic connections.

The achievements of the independent suppliers were clearly an outgrowth of the Federal Communications Commission's (FCC) ruling in the Carterfone case which said noncarrier-supplied equipment could be connected to the phone system.

Without this decision and subsequent FCC pro-competition rulings, the independent data communications suppliers would never have been allowed to exist, and customers would have been denied many of the devices and features which the Bell System companies introduced as competitive reactions to other vendors.

If the Consumer Communications Reform Act of 1976 is passed in a form that eliminates this competition, it is conceivable that innovative equipment introductions for data communications users would be greatly diminished and perhaps eliminated completely.

Because the independent suppliers are also the major source of modems that are incorporated into communications terminals, this segment of the industry would also disappear if the Reform Act became law. This would happen because Western Electric equipment is prohibited by regulatory and antitrust constraints from being supplied to noncarrier companies.

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FEC Unveils Campaign Turnkey

(Continued from Page 1)

To demonstrate the capabilities of its system and to get these services under way, the commission issued its first computerized, consolidated campaign finance report on Presidential candidates last week as well.

That report indicated a total of $77,875,647 was reported as campaign expenditures by all Presidential candidates during the January 1975 to August 1976 primary and prenomination period.

The 126-page printout indicated democratic candidates and their campaign committees reported $42,408,755 in receipts and $42,806,339 in total expenditures. Republican candidates and their campaign committees reported $32,475,977 in receipts and $29,986,245 in total expenditures.

Other candidates reported $660,632 in receipts and $772,228 in total expenditures in those 20 months.

While the figures also need to be verified by FEC audit, they do provide an indication of the total flow of money in the campaign, the commissioner said.

The first in what will be called the "FEC Disclosure Series," this report on Presidential prenomination receipts and expenditures for the 1976 campaign will be followed by similar reports on the financial activity of multicandidate special interest groups, on contributors to the Presidential campaign and on congressional campaigns.

At the beginning of April, Interactive Sciences Corp. (ISC) of Braintree, Mass., was selected to develop the necessary software and to acquire the system hardware.

The FEC is today renting a portion – 25% – of ISC's mainframe, a Digital Equipment Corp. Decsystem-10. ISC considers the system it constructed for the commission neither conventional time-sharing nor facilities management system, according to Alfred H. Jorgensen, an ISC senior vice-president.

The slow-speed, 1,200 bit/sec communications portion of the system relies on a DEC PDP-8 and on a Modular Computer Corp. (Modcomp) system.

For higher speeds, the system has Mohawk Data Sciences Corp. 2,400 bit/sec gear, Jorgensen said.

The rest of the communications system consists of two leased 9,600 bit/sec lines and data sets from AT&T and a Timeplex, Inc. multiplexer.

As for terminals, the FEC has 10 CRTs – Applied Digital Data Systems (Adds) 580s – and two Decwriter LA 36 printers. These are handled by one of the Bell telephone lines. The other line is connected to a 600 line/min Data 100 printer.

The entire system is costing the FEC about $500,000 for one year; approximately $300,000 is going toward equipment rental, Jorgensen said.

Sicob Opens in Midst Of Industry Quandry

(Continued from Page 1)

direct support to computer users to aid them in developing applications.

To date, most government support has gone to Compagnie Internationale pour l'Informatique-Honeywell Bull, the country's largest domestic mainframe maker. However, the government had planned to announce a major new program of support for both the peripherals industry and the minicomputer field at Sicob.

The plan would have called for the combination of several of the smaller peripherals companies into one new firm that would have received heavy government research funding as well as preferential purchasing.

The plan also would have called for increased spending in the minicomputer area, sources said.

Meanwhile, Sicob, with more than five floors of displays, opened in what most exhibitors described as an optimistic mood. American firms such as IBM, Data General, Burroughs, Computer Machinery Corp. and Telex will be strengthened if the government reduces its support to the French competitors here and so were out in force for the two-week show, expected to attract 300,000 visitors from over 100 countries.

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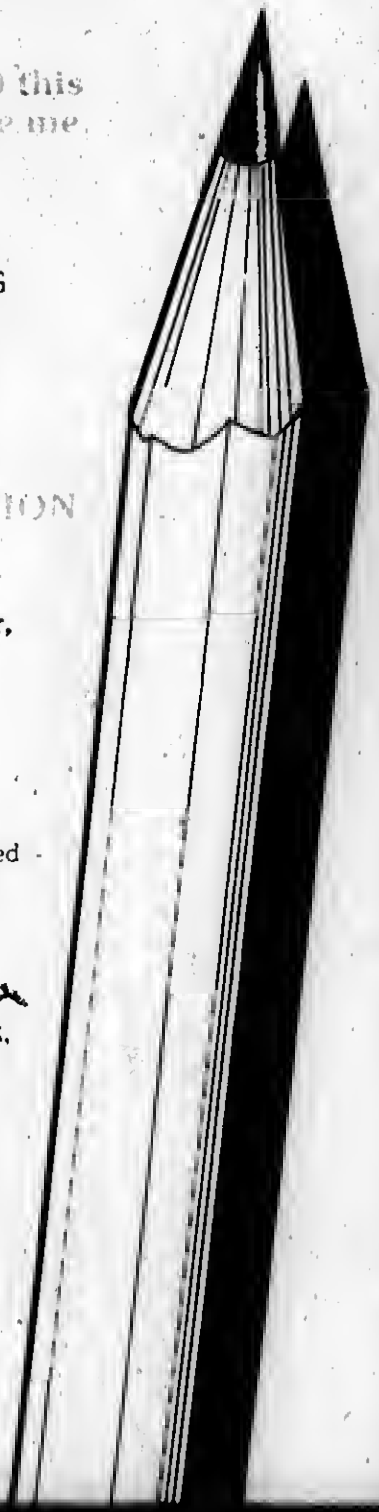

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1970 Report Foresaw Shakeouts

IBM Couldn't Pinpoint Software Industry's Vitality

By Molly Upton
Of the CW Staff

NEW YORK – Despite a "user population which does not yet know what its needs are," the software industry was apparently booming in 1970 in the wake of IBM's 1969 unbundling announcement, according to a report by IBM's Market Evaluation Department entered into evidence by the Justice Department in the U.S. vs. IBM antitrust trial.

Given the task of analyzing this somewhat amorphous, newborn phenomenon, the group concluded there were indeed possibilities for long-term growth, but there would be numerous shakeouts in the near term.

The writers of the study seemed unable, however, to pin down what the software industry was and where it was going because there were few patterns to be discerned.

"At this point in the history of software, we can detect no valid reason for drawing a pessimistic conclusion regarding the industry's future," the report said.

"So, although there is insufficient evidence to warrant the unrestrained optimism voiced by industry adherents, it is our judgment that the opportunities which are available will motivate independent software companies to find a profitable avenue – over the long haul," the report said.

"However, in the short term, there are so many pitfalls that numerous software companies will find the course too difficult. The survivors will be much fewer, much larger and more diversified than the industry is today," the report predicted.

Rather than being a hard-hitting report on a specific industry, the study lamented the "elusive" progress "software companies have made during the 1960s.

IBM Trial Documents

"Not only is it difficult to determine what is software and what is not, but even after one settles this dilemma (if only in his own mind), there does not appear to be any unanimity of overall direction, product scope or corporate emphasis."

The study defined software companies as those "which derive a major share of their revenues from consulting services, programming services or program products.

"Therefore, it is not at all surprising to find wide – and often unexplainable – variations in the financial performance of the companies in the software industry," the report continued.

"However, more critical to an evaluation of the future financial course of software companies is the fact that we have been unable to detect any significant characteristic in the histories of these companies which would enable us to determine the direction they might take in their quest for lucrative financial results," the group admitted.

The report outlined factors that might constrain growth as well as those that could prove to be opportunities.

In attempting to grapple with the industry, the report said "the almost unrestrained optimism with which the industry awaited IBM's [unbundling] announcement and the questioning and lingering doubts which have prevailed since June 23 give further credence to the judgment that the industry does not yet know where it is going or what the user wants.

"In this environment the independent software company, small or large, will have to deal with factors tending to constrain business growth":

- "The self-sufficiency concept" which indicates users are inclined to build up their own inhouse staffs.
- An "auto buying syndrome" or tendency to buy from one source, such as the mainframe manufacturer.
- "Need for manufacturers' documentation" which would necessitate a delay before others can develop a complementary or competitive product.
- The history of "for sale" packages.
- "Unknown cost of marketing proprietary products" – not much more than 5% of the firms have a professional marketing person.
- "Insufficient product support" by some could harm the industry's reputation.
- Long-term payback inherent in software development.

Software products have a heavier initial investment relative to sales price than do mainframes, the report said.

Also, vendors have to make most of their capital investment prior to shipping. The possible trend toward monthly leases, following mainframes, would further extend the time between investment and realization of income, the report indicated.

(Continued on Page 10)

Software Predictions Off?

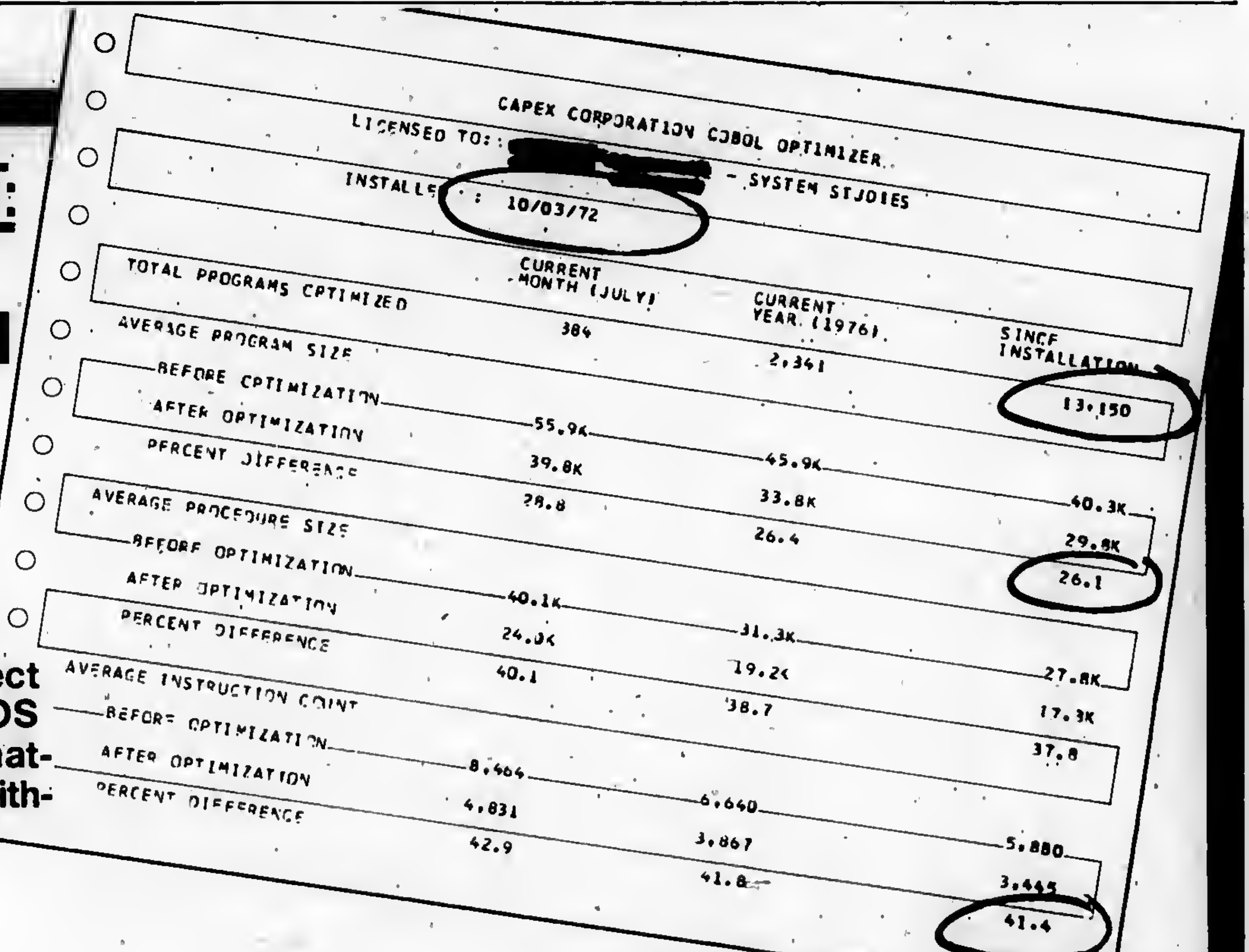
NEW YORK – IBM market evaluators predicted in 1970 that Applied Data Research, Inc. (ADR) would not be one of the top survivors in the software industry.

The evaluators examined the financial pictures of ADR, Computer Applications, Inc., Computing and Software, Inc. (CAS), Computer Sciences Corp. (CSC) and Computer Usage Co. (CUC), according to their report, filed as evidence by the Justice Department in the U.S. vs. IBM antitrust trial here.

The IBM team selected CAS as having by far the best chance for survival or success. Second place went to CSC which, after a large gap, was followed by ADR, Computer Applications and CUC.

In explaining this selection, the report indicated CSC was heavily involved with U.S. government contracts and labeled its efforts to provide commercial services by means of a heavy investment in Infonet as a "high-risk plan."

ADR's "limited product line," Computer Applications' "troubles with Speedata and generally poor plan for growth" and CUC's "program misfortunes, management problems and staff losses" gave "little reason for forecasting bright futures for them," the report said.



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                                  CURRENT          CURRENT        SINCE
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                                   384              2,341          13,150
AVERAGE PROGRAM SIZE
  BEFORE OPTIMIZATION              55.9K            45.9K          40.3K
  AFTER OPTIMIZATION               39.8K            33.8K          29.8K
  PERCENT DIFFERENCE               28.8             26.4           26.1
AVERAGE PROCEDURE SIZE
  BEFORE OPTIMIZATION              40.1K            31.3K          27.8K
  AFTER OPTIMIZATION               24.0K            19.2K          17.3K
  PERCENT DIFFERENCE               40.1             38.7           37.8
AVERAGE INSTRUCTION COUNT
  BEFORE OPTIMIZATION              8,464            6,640          5,880
  AFTER OPTIMIZATION               4,831            3,867          3,445
  PERCENT DIFFERENCE               42.9             41.8           41.4
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Seattle City Council in Midst of $1 Million DP Snafu

By Don Leavitt
Of the CW Staff

SEATTLE – The City Council here is caught in the middle of a million-dollar hassle involving two of its own departments, at least two outside consulting groups and a major DP project that is late, incomplete and already well above budget.

When first envisioned in late 1972 and early 1973, the Integrated Financial System (IFS) was to be a set of related applications, all of which tied back to a central Budget Control System. The software could be all ready by 1975 for a cost of about $384,000, the planners estimated.

To date, the budget system has been implemented and is finally in production mode after well over a year of faulty operation and a shift, involving conversion work, from one computer center to another. The other applications have been designed but apparently not programmed, awaiting a go/no-go decision from the council.

The cost of the project has apparently reached $1.45 million. Various officials were quick to point out, however, that total includes substantial amounts – on the order of $35,000/mo during 1975 and early 1976 – for time at a commercial data center.

The outside time was required because the city failed to decide what equipment it wanted for its own facilities, a decision that had been expected to take place in 1974 or 1975.

The cost has been inflated also by the city's inability to supply as much staff support to the two contractors as had been originally expected, largely because the city didn't have the expertise available. At least some of this manpower was supplied by one of the contractors for a price.

Changes in design have added their cost to the development effort but, in fact, the cost of creating the base system has not been overrun nearly as much as the gross cost of developing and running it to date would make it seem, according to Gary Roats of Touche-Ross, the system design contractor.

With headlines such as "The Computer That Didn't," the local general press is having a field day reporting the day-to-day status of the IFS project. Various factions advocate continuing development of the system, scrapping it completely and, somewhere in between those two extremes, retaining what has been installed and using it as a base to build a less ambitious system.

Estimates on how much of the project has been completed vary. The IFS supporters note the budget system is the kingpin; it is operational; the overall design has been somewhat curtailed from its original all-encompassing scope; and the interfaces between budget and the other applications are well understood.

With that assessment of the situation, they see the project as already 60% complete.

Opponents of IFS have a different, darker view. Even if the design was good, the programming – done under contract by Boeing Computer Services – was rushed once the go-ahead was made in the fall of 1974 and was clearly full of problems, as evidenced by the year or more it took to get the budget system to work properly.

The additional applications haven't been programmed yet and the cutback in the scope of the project is no reason to claim a higher percentage of completion than if the initial plans were still in place, they noted.

"About 20%" seemed to be their estimate of how much of the system was finished.

The future of the system is intimately tied into how Seattle decides to handle its overall DP needs from now on. Having failed to decide on an appropriate in-house configuration for installation in 1975, the city put the budget system up on the IBM 370/155 at Boeing Computer Services.

The cost of that operation led Seattle to move the programs to the King County data center, also utilizing a 155. But there appear to be serious questions about the capacity of that hardware to successfully support the workloads of both the city and the county.

That situation suffers, as well, from dual city/county managements that often compete with each other for system resources, according to a set of status reports prepared last month by the city's Office of Management and Budget/Management Information Services, which took control of the IFS project in mid-1975 and advocated continuing development based on the "good sound" design already specified.

These reports advocated establishing a separate computer facility as soon as possible.

IBM Couldn't Pinpoint Software Scene

(Continued from Page 9)

- "Scarcity and mobility of personnel."
- "Lack of experienced management."

But there are opportunities for the independent software firm, the IBM group said. It can:

- "Fill areas abdicated by the manufacturers" such as detailed program coding or management consulting – "a function the manufacturer's representative may be forced to abdicate or reduce because of his lack of systems manpower."
- "Provide continued support for superceded software."
- "Utilize [its] unique know-how to provide answers for specialized applications."
- "Capitalize on the comparative freedom from standards and documentation practices to react quickly," i.e., lack of red tape.

The report also cited a couple of additional factors it saw contributing to long-term growth. One of these was the overwhelming popular opinion that business would expand through the '70s and, in some cases, well into the '80s.

"But in the short term a downturn in the national economy, cutbacks in government spending [and] a need for more experienced management, together with the marketing, financial and personnel constraints generally prevalent in the industry, will result in lost identity for many software companies," the report added.

"Some of these companies will simply go out of business; others will be swallowed up by larger and more stable competitors; and a few will be acquired by their principal customer – the user," the report predicted.

In attempting to detect a pattern, the report writers asked, "Does such an industry even exist?"

Even with its definition of the industry, it found only 12 companies with revenues of $6 million or more in the latest calendar or fiscal year in an industry comprised of 2,000 to 3,000 individual enterprises, most of which were not large or mature enough to allow a valid industry assessment, the report indicated.

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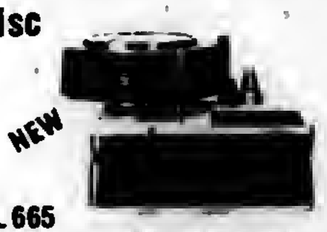

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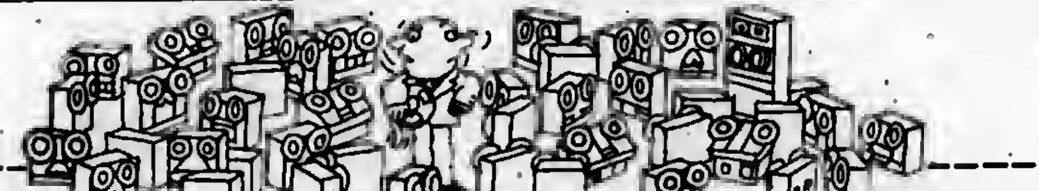

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For Industry, Commerce and Home

Energy Conservation Seen as Major DP Application

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. – Computers can help save energy for the U.S. initially in industrial and commercial applications, but eventually in individual homes as well, according to Brian Travis of EMS/Datrix Corp.

Speaking at Compcon '76, the IEEE Computer Society's 13th International Conference held here recently, Travis and Mike Chidester of IBM agreed energy conservation is a major new application for the computer industry.

"Reduced energy consumption has been clearly established as a national priority," Travis said, adding energy management systems cannot only offer assistance in achieving this priority but in reaching its related goals – minimizing energy costs and ensuring energy availability.

Computers can help industrial and commercial users reduce their energy consumption by 20% to 30%, he noted. From the industry's viewpoint, this application area will represent a $10 billion annual market by the fourth quarter of 1977.

The key to reducing consumption is to "optimize a facility's load profile," Travis said, referring to what time of the day or week and in what quantities the facility uses energy. The idea is to minimize the peaks in the demand for energy that now tend to be placed on utilities, particularly those providing electric power.

Large computer networks are required for energy modeling of specific industrial and commercial facilities because energy analysis programs tend to be large, expensive and complex and to require significant amounts of runtime, Travis said.

Minis and Micros

Once a facility's energy usage has been profiled, however, minicomputers and even microcomputers can monitor and optimize the scheduling of energy consumption within a facility and provide improved environmental control at the same time, Travis explained.

These smaller computers rely on the data base created by the modeling exercise. A user can recover the cost of modeling his facility's load profile in less than a year through the energy savings gained alone, he maintained.

But, he added, industrial and commercial consumers will require additional price incentives to move in the direction of energy conservation.

Energy conservation is the only System 7 application area for which IBM has created a separate marketing organization. That organization consists of a special marketing group which is part of the General Systems Division in Atlanta, Chidester said.

In addition, there is a 16-person service, programming and development staff working on this area alone in San Jose, Calif.

Companion Senate Bills

There are currently companion bills before the U.S. Senate, S. 3310 and S. 3311, that would force the utilities to balance loads better by changing their rates, Travis noted.

The utilities and their users are already moving in this direction, however, and don't require government intervention, he said.

Not only industrial and commercial facilities, but residential power consumers as well are thinking along these lines, he added.

"The electric utility industry would much prefer to have dishwashers and electric hot-water heaters that only operate during the utility's off-peak demand periods.

"They would also prefer to have refrigerators with storage compartments to create and hold excess heat when the consumer's air-conditioning system is functioning at peak operation," Travis stated.

All this requires intelligent control, he observed. Citing the growing acceptance of microprocessor units in home entertainment centers and microwave ovens, he suggested computers will eventually be used in home energy conservation as easily and as often as they are starting to be used in industrial and commercial applications.

Working with concepts very similar to those used at Datrix, IBM's Power Management System, based on a System/7, is intended "to lower the dollar amount of the bottom line of the energy bill and to create more-effective utilization of electrical power at all levels of demand," according to Chidester.

Once again, the goal is to reduce the total energy curve for an industrial or commercial facility throughout a 24-hour period.

While an intelligent device – the computer – is used to reduce demand, it must be programmed to do so without interrupting the production of the user's people or affecting their comfort or creating a safety hazard, Chidester said.

Accordingly, a survey is made of the "manageable" devices in the facility, he explained, adding these devices are put in a list indicating the priorities in which they are to be controlled.

These devices are controlled by a system working in conversational mode – in English – with its operator at all times, thus eliminating the need for a trained computer operator, Chidester noted.

Before installing any conservation device, however, he advised those who would minimize their energy usage to take an inventory of the energy consuming devices in their facility, to learn how their facility uses energy, to develop a control strategy and to compare the gross dollar savings with the installation costs.

Chidester cited statistics from his corporation that support Travis' comments that this computer application is growing.

Between 1973 and the end of 1975, IBM installed some 400 power management systems; between January 1 and July of this year, the company added another 200 installations to this base.

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Fernbach, Fuller Clash

Mini vs. Maxi Debate Stirs Discussion of DP Future

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. – Which statement do you believe?

- "Maxi" computing at one centralized location is here to stay because large problems require lots of computing power and big systems offer the mix of services needed to solve them.
- "Mini" computing in distributed fashion offers cost/performance, modularity and reliability advantages over large-scale, centralized computing and will eventually supersede maxis.

These were the positions taken by Dr. Sydney Fernbach of Lawrence Livermore Laboratory and Dr. Samuel Fuller of Carnegie-Mellon University respectively at a debate held here recently during the IEEE Computer Society's Compcon '76.

Even if distributed processing does take over, "large systems will be required to link any large group of minicomputers together," Fernbach said.

Maxis will be kept in business in their own right because there are "tremendous needs in this country and the world for large and very large computers," he argued.

Problems Keep Growing

The already large problems continue to grow – be they in plasma physics, social security, traffic control or the economy – and the models required to understand them are increasingly more complex, Fernbach stated.

Real time becomes involved because those trying to solve these problems find turnaround time to be important. Without short response times from a computer system, years would be required to build a model or to develop a solution to a problem, he said.

The segmentation of some of these problems is very difficult, Fernbach added. Any one language doesn't easily permit this, but large general-purpose computers provide extensive language capabilities that are easy to access at the same time. This assists in chopping problems up into manageable pieces, he said.

Large computers are more cost-effective, Fernbach argued further. "The bigger the memory, the better," he said, adding memory and software, the two greatest costs of any computer system, tend to cost less in a large system.

A group of minis will require the same group of peripherals needed on a large machine, so there isn't any cost reduction there, Fernbach noted.

Fuller agreed the cost effectiveness for minis was about the same compared to that of maxis until memory costs began to drop at the beginning of 1975.

The Carnegie-Mellon professor maintained the computer industry will see many more distributed systems in the years ahead. There aren't more now because a "nontrivial" amount of engineering work remains to be done, he said, adding the technology and the "breakthroughs" in distributed processing have already been accomplished.

Relying on his own work with a system made up of 16 Digital Equipment Corp. PDP-11s and called "C.MMP," Fuller said only a negligible amount of degradation of memory ever occurs because these processors share it.

Degradations of no more than 5% to 10% in performance measured in response time have resulted from C.MMP's distribution of processing tasks. Many predicted this degradation would occur by a factor of 2 to 3 prior to the Carnegie-Mellon work, Fuller stated.

Problems can be decomposed to run on multiminis, he said. In addition, Fuller noted he views the decomposition of problems as the central issue on which minis vs. maxis will rise or fall.

"At Carnegie-Mellon, we have shown linear speedup or encouraging speedup in the decomposition and the solution of traditionally complex problems," he said.

"Remember we are talking about a multimini that is twice as powerful as an IBM 370/168," Fuller said, referring to C.MMP.

"The killing thing on the PDP-11 is its small language space. We spend less time decomposing problems and more time shoehorning problems into the small address space of the PDP-11," he added.

Fuller agreed there is work to be done in the area of reliability in distributed processing. The diagnostic problems and the difficulties involved in providing adequate communications between the modules of the system are key, he said, noting the work with C.MMP has yet to delve deeply into these areas.

Despite the "engineering problems" distributed processing continues to pose, it is affordable and its features make it attractive to those who wish to distribute their processing on a geographic basis or who are interested in networking, according to J. Robert Wood of IBM's Federal Systems Division, who chaired the debate.

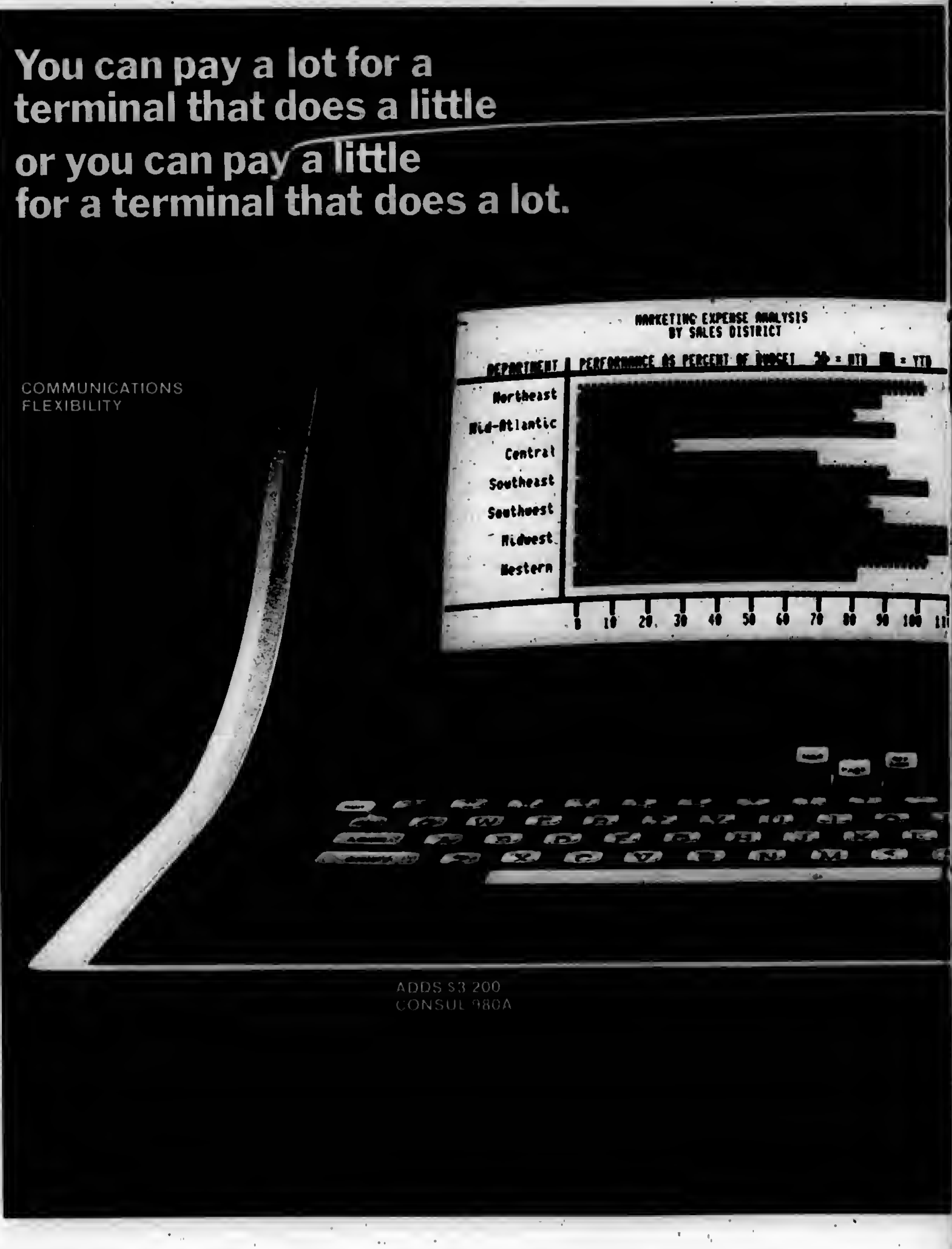
Privacy Unit Plans Hearings on Schools

LOS ANGELES – The Privacy Protection Study Commission will hold public hearings here on the recordkeeping practices of educational institutions on Oct. 7-8.

The hearings, which will consider protections afforded the personal data of elementary, secondary and postsecondary school students by the 1974 Family Educational Rights and Privacy Act, will be held in Room 8544 of the Federal Building at 300 N. Los Angeles St.

The commission is seeking testimony on four types of recordkeeping systems maintained by educational institutions: education records; medical records; law enforcement records; directory information; and research records and "desk drawer" notes.

Those interested in assisting the commission should contact its executive director, Carole Parsons, in writing at Suite 424, 2120 L St. N.W., Washington, D.C. 20506.



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System Design During Development Called Reasonable

By Don Leavitt

Of the CW Staff

LONDON – System design – especially for large projects – may well be impossible to complete before development work begins, but that is quite reasonable as long as an installation has an orderly plan by which it can control completion of the design as the project moves along, according to Fergus O'Brien of PA International Management Consultants Ltd.

"System design is the main transformation between the user specification and the detailed computer-oriented specifications," O'Brien explained at the recent European Computing Congress here.

The design has two functions – to show how the user's needs will be fulfilled and to show the computer implementation is feasible, he added.

The first of these functions often has its own problems, he said, explaining that, for example, "a user requirement such as 'ease of use' cannot be said to be defined in a completely meaningful way."

But if the designer is willing to accept specifications that are "necessarily incomplete," work can go forward even on projects involving more than 100 man-years of software effort, he told his listeners at a session on software engineering.

Changeable Ambition Levels

Control must start right in the initial system design phase or the base for continuous development is gone, O'Brien said. This means the designer must be sure to include various system-specific concerns even though the user's specifications focus on his application needs.

"Operator interfaces, recovery and standby [procedures] are deferred to one's peril," he cautioned.

Perhaps even more important, he added, is to design a system with a "changeable ambition level." The technique is to construct the design as a series of subsets of increasing ambition level so omission of a highly ambitious feature "can be contemplated without recrimination."

Properly done, this could lay the groundwork for a series of releases which enhances the project rather than the all-too common series of releases needed to catch up with a design that was too ambitious and had to be torn apart to make it work, O'Brien said.

Once the project reaches the implementation phase – the most difficult of all, in O'Brien's view – the continuing control approach requires great changes in the usual staffing pattern.

'Guinea Pigs' Needed

In addition to a design control group to approve any changes before they become part of the system, O'Brien also sees the need for a design questions group – which tries to settle problems or work around them – and a group of "guinea pigs."

These guinea pigs, he explained, are some of the more advanced users of a new facility. They should be brought into the project at an early prerelease stage in order to contribute test cases and experience.

With such a group in place, the quality of products can be improved and the time span for development shortened. In the end, these users are also useful in training the groups from which they came, he noted.

The benefits of bringing the design groups and "guinea pigs" together are so substantial, he continued, it is feasible to consider writing substantial parts of the software twice during a project so all concerned gain a better understanding of what is needed.

Combining Two Tasks

The system integration phase can be modified, O'Brien suggested, so the two tasks of fault finding and fault correction are separated. It is the fault finder's job to make and preserve tests and to pass bad test results to the correctors, he said.

It is the latter group's job to correct the fault while still maintaining the system design as it developed during implementation. In this way, the most effective use is made of scarce resources – especially personnel – and, more importantly, design divergence is contained, O'Brien said.

The results of providing continuing, adaptable control in actual projects show productivity has more than doubled, code contains half the errors and projects now overrun to within a maximum 10% rather than 100%, he said, noting finally that "some projects are now coming through under budget."

Bike-Mounted Micro Monitors Exerciser

LOS ANGELES – These days a bicycle can not only relieve a person of several pounds of unattractive fat, it can also monitor his fitness level, calorie loss and heartbeat.

Based on a PPS-4/2 microcomputer from Rockwell International, the Dynavit monitoring bicycle accepts inputs of age, weight and sex to calculate a loading on the machine's pedals.

These three factors are punched in with a keyboard while the exerciser's heartbeat rate is fed into the system from a wristband sensor.

During 10 minutes of exercise, the microcomputer calculates the user's "health factor," a Dynavit number which is displayed on the machine.

The Dynavit number ranges from zero to 150. An average person who exercises periodically will score from 50 to 75, a more athletically inclined person will rate between 75 and 100 and a professional athlete should show above 100.

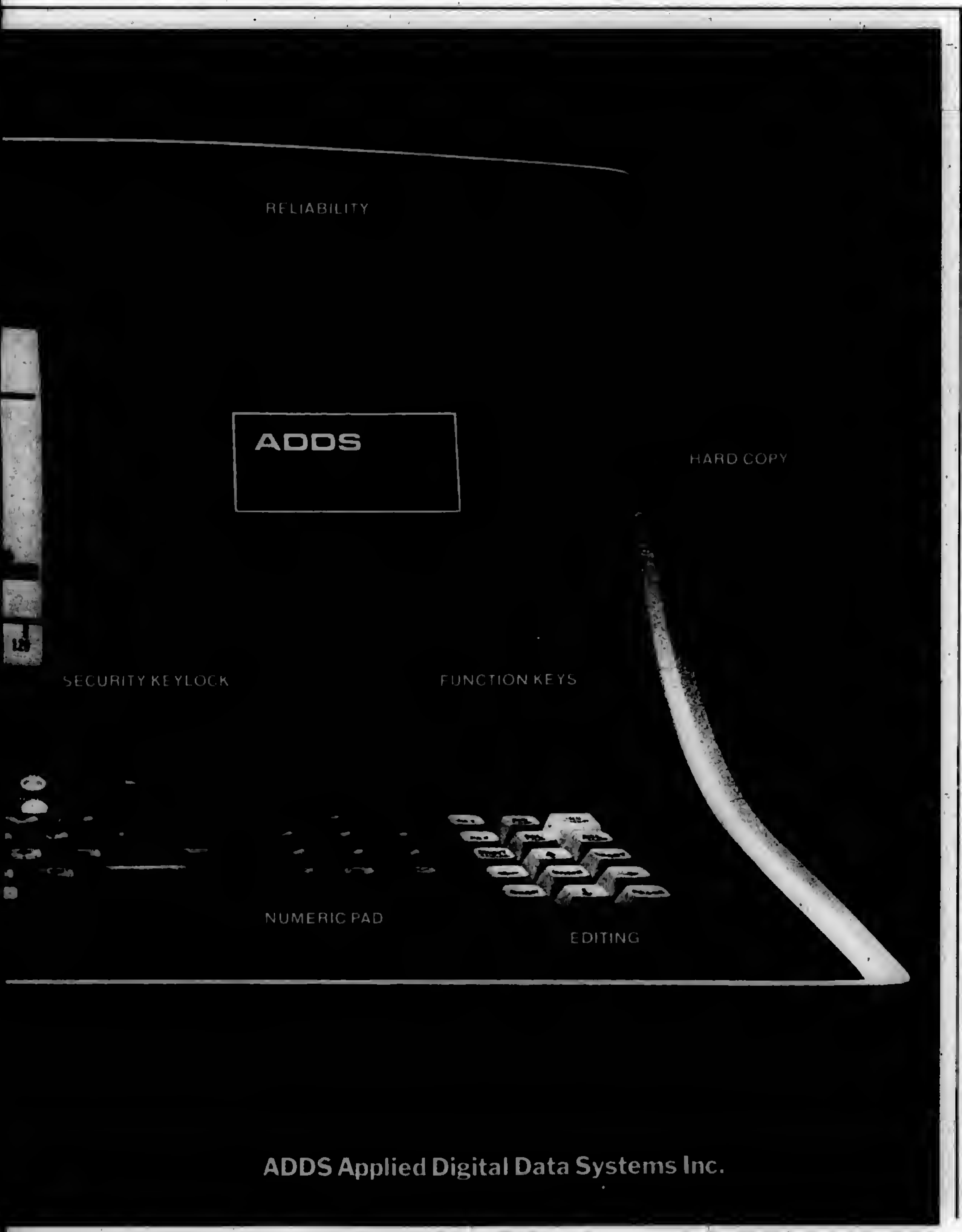
The microcomputer contains algorithms in its program memory which compare the monitored heart rate input with normal rates and flashes a green light that all is well.

If pulse rate becomes too rapid, a red light flashes, warning the user to either slow down, stop or reduce the pedal loading by pushing a button on the console.

The machine is also capable of calculating calorie loss during exercising and displaying the result.

Manufactured by the German firm Keiper, the blcycle should be available in the U.S. in about six months.

In Germany, the bike sells for about $900. It was publicly demonstrated for the first time in the U.S. at the recent Western Electronic Show and Convention (Wescon) here.



Sponsored by ICCP

Registration for CDP Test Open

CHICAGO – Registration for the 1977 Certificate in Data Processing (CDP) examination is now open, according to Fred Harris, president of the Institute for Certification of Computer Professionals (ICCP).

Registration forms and information are already in the hands of ICCP's constituent societies and mailings have been made to major user groups in business and academia, Harris said.

Besides the monetary and practical reasons for taking the exam, Harris cited the personal value gained from preparing for it – honing skills and filling gaps of knowledge.

The CDP examination was first offered in 1962. Since then, about 16,000 people have received CDP certificates.

The five-part exam covers equipment, programming and software, principles of management, quantitative methods and systems analysis and design.

Applicants may sit for one, several or all five sections; however, all five parts must be completed to receive the CDP.

The test is administered for ICCP by the Psychological Corp. of New York, an educational testing service.

Almost 38% of last year's examinees passed the test [CW, Sept. 13].

Additional information is available from the ICCP at 35 E. Wacker Drive, Chicago, 60601.

Societies/ User Groups

Calendar

Sept. 27-29, New York – **Minicomputer Applications**, sponsored by the American Institute of Industrial Engineers (AIIE). Contact: Department PR, AIIE Seminars, P.O. Box 25116, Los Angeles, Calif. 90025.

Sept. 28-30, Montreal – **Canadian Computer Show** Contact: Canadian Computer Show, 481 University Ave., Toronto, Canada M5W 1A7.

Sept. 29-Oct. 1, Chicago – **"Manufacturing Data Systems,"** sponsored by the American Institute of Industrial Engineers (AIIE). Contact: Dept. PR, AIIE Seminars, P.O. Box 25116, Los Angeles, Calif. 90025.

Sept. 29-Oct. 1, Madison, Wis. – **1976 Mumps Users' Group Meeting.** Contact: Dr. Joan Zimmerman, Mumps Users' Group, Biomedical Computer Laboratory, 700 S. Euclid Ave., St. Louis, Mo. 63110.

Oct. 3-6, Hartford, Conn. – **Forum 1976 Fall Conference for Singer Information Systems users.** Contact: Forum International, 4902 Tollview Drive, Rolling Meadows, Ill. 60008.

Oct. 5-7, New York – **Business Show '76.** Contact: Convention Management Association, P.O. Box 32, Carle Place, N.Y. 11514.

Oct. 6-7, Philadelphia – **Instrumentation and Computer Fair.** Contact: Robert E. Harar, executive director, Instrumentation and Computer Fair, 5012 Herzel Place, Beltsville, Md. 20705.

Oct. 10-16, Anaheim, Calif. – **27th Congress of the International Astronautical Federation.** Contact: American Institute of Aeronautics and Astronautics, 1290 Ave. of the Americas, New York, N.Y. 10019.

Oct. 12-13, Syracuse, N.Y. – **Syracuse University School of Computer and Information Science Symposium.** Contact: School of Computer and Information Science Office, 313 Link Hall, Syracuse University, Syracuse, N.Y. 13210.

Oct. 12-14, New Orleans – **Civil Engineering Program Applications 24th Semiannual Conference.** Contact: John H. Carman, conference chairman, P.O. Box 1532, Rockville, Md. 20850.

Oct. 13-15, San Francisco – **Second International Conference on Software Engineering.** Contact: Jean Sherman, IBM D63/026, 5600 Cottle Road, San Jose, Calif. 95193.

Oct. 18-22, Rio de Janeiro, Brazil – **IX National Data Processing Congress,** sponsored by the Brazilian Society of Computer Users (Sucesu). Contact: Raul Isiris, Sucesu, Rua do Resende, 37-60, Rio de Janeiro – RJ, Brazil.

Oct. 19, Los Angeles – **Western Systems Conference,** sponsored by the Association for Systems Management. Contact: Bob Dales, program chairman, Mattel, 5150 Rosecrans Ave., Hawthorne, Calif. 90250.

Oct. 19-21, San Francisco – **1976 Mini/Micro Computer Conference and Exposition.** Contact: Robert D. Rankin, 5544 E. La Palma Ave., Anaheim, Calif. 94807.

Oct. 19-21, Chicago – **Automated Inspection and Product Control Conference.** Contact: Dr. Keith E. McKee, IIT Research Institute, 10 W. 35th St., Chicago, Ill. 60616.

Oct. 24-27, Las Vegas – **Info/Expo '76,** sponsored by the Data Processing Management Association (DPMA). Contact: DPMA International Headquarters, 505 Busse Highway, Park Ridge, Ill. 60068.

Oct. 25-27, Houston – **17th Annual Symposium on Foundations of Computer Science.** Contact: Prof. Meera Blattner, Department of Mathematical Sciences, Rice University, Houston, Texas 77001.

Oct. 25-27, Tucson, Ariz. – **Frontiers in Education Conference,** sponsored by the Institute of Electrical and Electronics Engineers, Inc. Contact: Dr. G.R. Peterson, Electrical Engineering Department, University of Arizona, Tucson, Ariz. 85721.

Oct. 25-27, Toronto – **45th Management Conference of the Association of Data Processing Service Organizations (Adapso).** Contact: Adapso, 210 Summit Ave., Montvale, N.J. 07645.

Oct. 28, Toronto – **Canadian Association of Data Processing Service Organizations (Cadapso) Annual General Meeting.** Contact: Argyle Syndicate Ltd., Suite 301, 47 Colborne St., Toronto, Ont.

Oct. 28-30, Portland, Ore. – **1976 National Association of Users of Computer Applications to Learning Conference (Naucal).** Contact: Dr. John Mandelare, Naucal registration chairman, Clackamas Intermediate Education District, Marion Hall, Marylhurst Campus, Marylhurst, Ore. 97036.

Oct. 28-31, Cambridge, Mass. – **International Conference on Computer Music.** Contact: Prof. Barry Vercoe, Room 26-313, MIT, Cambridge, Mass. 02139.

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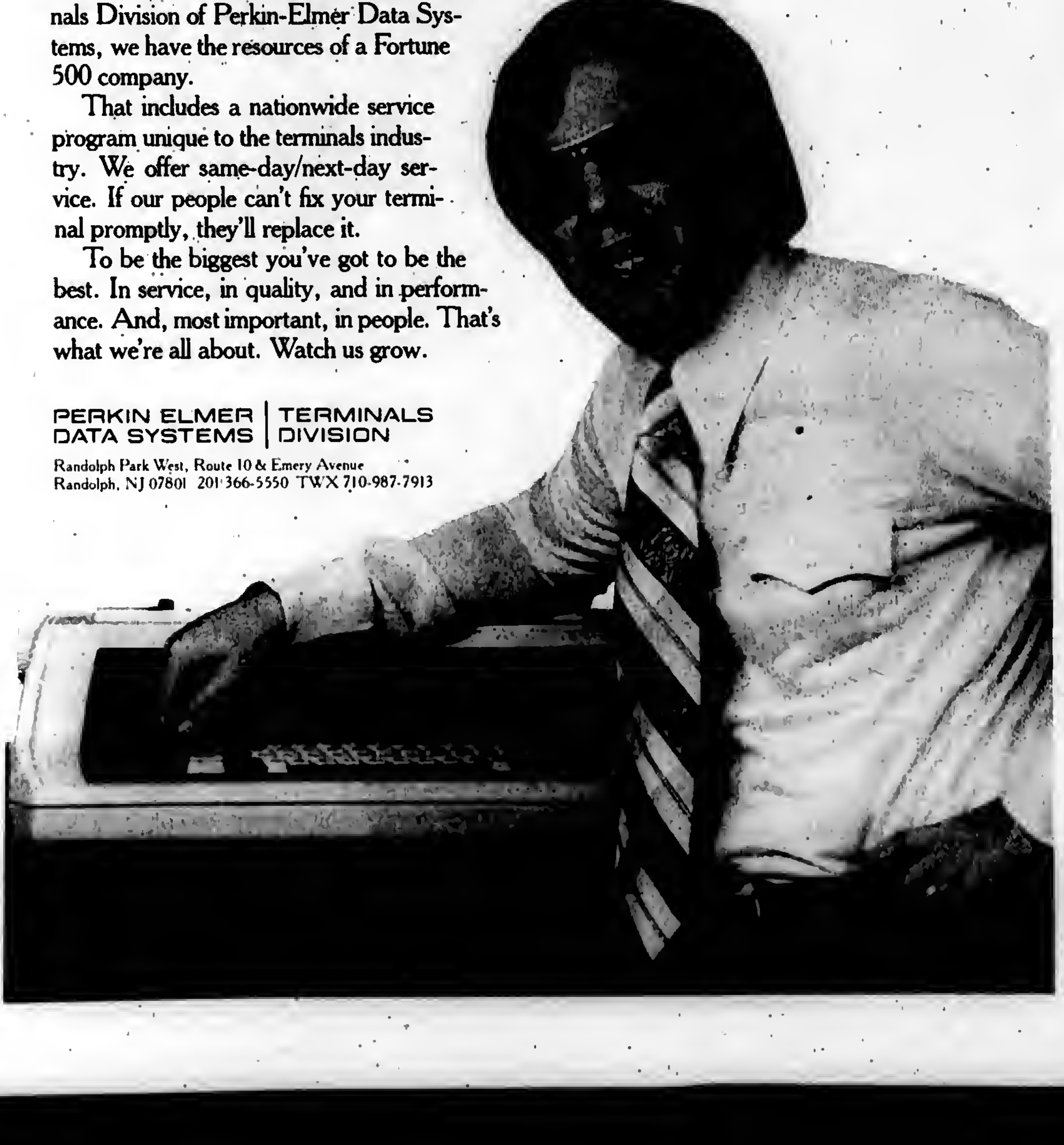

Chess Anyone?

HOUSTON – Entries are now being solicited for the sporting event of the computer world – the Seventh U.S. Computer Chess Championship.

The tournament will be held in conjunction with the Association for Computing Machinery's (ACM) annual conference here Oct. 19-21.

A four-round Swiss-style tournament is planned and the field will be limited to 12 teams. David Levy, International Master from England, will direct.

Application forms are available from Dr. Monroe Newborn, School of Computer Science, McGill University, Montreal, Quebec H3C 3G1, Canada.

NCC '77 Steering Committee Named

DALLAS – Plans for the 1977 National Computer Conference (NCC) to be held here June 13-16 moved one step ahead with the naming of steering committee members.

Conference chairwoman Dr. Portia Isaacson, assistant professor of mathematical sciences at the University of Texas at Dallas, and Dr. Robert R. Korfhage, professor of computer science at Southern Methodist University, have chosen a steering committee from those active in the Southwest DP community, primarily Dallas.

Norman P. Teich of Recognition Equipment, Inc., will head committee communications; Jerry Johns, Texas Instruments, Houston, will be responsible for exhibits; Edward V. Resta of E-Systems in Dallas will handle fiscal arrangements; and Dr. Alex A.J. Hoffman of Texas Christian University in Fort Worth will head local promotion.

Russell Brown of Moore Paper Co., Houston, will head NCC committee liaison while Robert L. Wade of Continental Trailways in Dallas will handle operations.

Harold A. Mauch, Percom Data Company of Garland, has been assigned to personal computing. Dr. Ronnie G. Ward, University of Texas at Arlington, will head professional seminars and Gabrielle Wiorkowski of Richardson will handle publications.

Wayna Churchman, Hewlett-Packard, Richardson, will be responsible for registration and Dr. Dennis J. Frailey of Southern Methodist University, Dallas, will be responsibla for society liaison. Dr. C.E. Rodriguez of East Texas State University in Commerce will look after special activities.

Dr. Carl Hammer of Univac in Washington, D.C., will act as committee advisor.

Under Korfhage's direction, the conference program has been divided into four major areas: the technology of computing, management and computing, uses of computing and the individual and computing.

As a special highlight, the conference will also include a program dealing with personal computing along with a national programming contest open to all attendees.

About 250 exhibits are expected to be displayed in more than 1,000 booths, according to the American Federation of Information Processing Societies, Inc. (Afips), the NCC sponsor.

Additional information on the 1977 NCC is available from Afips at 210 Summit Ave., Montvale, N.J. 07645.

Societies/ User Groups

DP Art Exhibit Set For ACM Conference Next Month in Texas

HOUSTON – A "Computer Arts" exhibit will be held here during the Association for Computing Machinery's (ACM) 1976 national conference Oct. 20-22.

The conference committee is planning to have several display areas and is hoping to provide some terminals which will allow spectators to generate their own computer art.

Participation in the exhibit is welcome, the ACM said. Further information is available from Eileen Head, Lockheed Electronics, Inc., 16811 El Camino Real, C-42, Houston, Texas 77058.

IEEE Catalog Available

LONG BEACH, Calif. – Tha 1976 edition of the IEEE Computer Society *Publication Catalog* is now available.

The catalog includes information on the society's Standing Subscription Plan, which allows subscribers to receive preordered publications at more than a 10% savings, as well as listings from conference, workshop and symposium publications.

Catalogs are available free of charge from the Computer Society Publications Office, Suite 301, 5855 Naples Plaza, Long Beach, Calif. 90803.

ACM Has Proceedings On Meeting for Deaf

NEW YORK – Proceedings of the 1975 Association for Computing Machinery (ACM) Conference on Computing Caraers for Deaf People have been published.

The conference, sponsored by the ACM Special Interest Group on Computers and the Physically Handicapped (Sigcaph), was held in April 1975.

The conference featured 30 presentations covering such topics as educational opportunities, special training programs, placement problems and solutions, federal legislation, on-the-job problems and solutions and success factors.

The proceedings contain 125 pages and cost $6.75 for ACM members and $9 for nonmembers from the ACM Order Department, P.O. Box 12105, Church St. Station, New York, N.Y. 10249.

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'Arcane Nonsense' Seen Just One Use of Personal DP

By Toni Wiseman
Of the CW Staff

LOS ANGELES – Personal computing systems are generally being used to do what computers have always done: automate functions and calculations and handle information storage and retrieval.

The "ideal" personal computing system in 1976-77 could, however, be used for very personal applications including games, personal business processing, hobbies and "arcane nonsense," according to Carl T. Helmers Jr., an editor at Byte Publications, Inc.

This ideal computer would be "a composite of currently existing and proven hardware and software together with newly marketed components" such as the 16K dynamic memories, he told a session at the recent Western Electronic Show and Convention.

Not for 'Purist'

Helmers cautioned that his ideal computer is not for the "purist" or the professional engineer. Rather, it is geared for the computing equivalent of the person who purchases an automobile for transportation and pleasure.

The computing power of the system would be supplied by a contemporary high-performance, general-purpose microprocessor, one with a general-purpose instruction set comparable to a traditional minicomputer, he said.

It would also include ample programmable memory since "applications programming is by nature transient in a general-purpose computer system," he said.

Helmers recommended 8K bytes with the 4K dynamic chips and, when the 16K dynamic chips are available, a standard minimum of 16K bytes with upward growth built in using unpopulated socket positions.

Helmers envisions a video generator sharing timing chains with the processor clock, preferably with 64 char./line with upper- and lower-case Ascii graphics and possibly including limited user-controlled graphics capabilities.

A text data entry keyboard must be integrated into the personal computer, he said, since the computer is otherwise confined to fairly cumbersome interactive sequences.

Audio Provision

At least two channels of data generation and decoding intended for use with audio media should be part of the ideal system, he suggested. "Perhaps 2K to 4K bytes of system software in [read-only memory] is part of the design of the personal computer product," he said.

"There are no toggle switches and banks of LED indicators in a properly designed consumer computer product, since the bootstrap and system service functions are done through the keyboard and display using this software.

"The minimum software should include drivers from the audio tape systems, memory editing and debugging routines for low-level programming enthusiasts, a good text editor oriented to the serial media used for mass storage, I/O routines and service routines with hooks available to high-level language routines as well as applications software," he stated.

No Reason to Sneer

Many people sneer at games and fun implemented with computers and Helmers agreed the $2,000 figure spent on a machine which would perform only games might be an excessive item in the typical family budget.

He argued, however, that there is a real question of whether a game of "Star Trek" is a training ground for military tactics and limited resources problems or just a diversion for an evening's fun, and whether the game of Hammurabi is a sophisticated form of entertainment or a tool for teaching the art of decision making.

The overlap between the use of the personal computer for fun and its use as an educational tool is most pronounced in the simulation games areas, he said. But the educational uses are by no means confined to such simulations.

Rote drill materials are a good example of the educational applications optimally suited to personal computers, he noted.

'Little Black Book'

Helmers suggested the use of the personal computer for "personal business processing" such as aiding in filling out federal income tax forms.

It could also be used to keep track of dates and calendar commitments, to record kitchen recipes or to work as a "little black book" of names, addresses and phone numbers.

Finally, in the realm of "arcane nonsense," a user could tackle something in the area of the science fiction tale theme of "The 900 Billion Names of God."

'Garbage' Calculations

"Just as computers can be used to automate real world 'serious' games and fun, they can be used to automate 'garbage in/garbage out' calculations of a superstitious and mystical nature, thereby lending a false aura of veracity to the result," he stated.

"The opportunities for such applications multiply by orders of magnitude with the lowering of costs for this technology."

Computers have, for example, been used to calculate biorhythms, cast horoscopes and tell fortunes, he noted.

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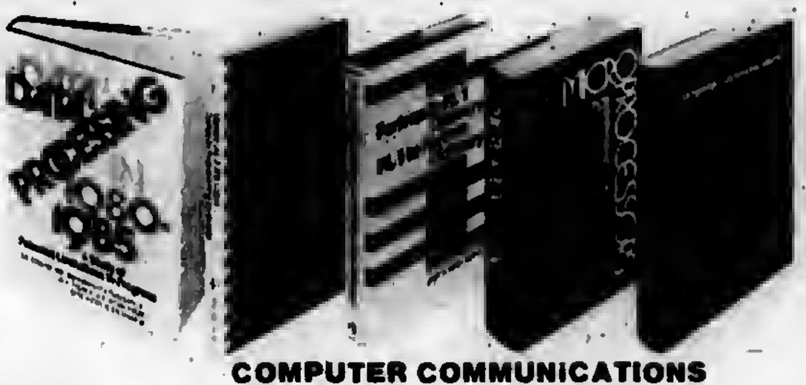

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Editorial

Fact or Fiction?

The AT&T-fostered Consumer Communications Reform Act of 1976 starts down what may become a long legislative road this week when hearings on the bill are held by the House Subcommittee on Communications.

Somewhere during the rhetoric that is bound to flow from both sides, it is to be hoped the subcommittee carefully looks at the impact competition has had on telecommunications.

There is no doubt at all users have a wider range of equipment and service choices because of the competitive pressure exerted by independent companies on the Bell System and its allies.

One significant segment of this equipment pressure has occurred in the data communications sector. Two articles in *Computerworld* [CW, Sept. 20, 27] have sketched the significant contributions made by non-Bell suppliers for users of this equipment. There are other areas, such as PBXs, where a similar story has unfolded.

On the other end, there has been virtually no evidence presented to support the often wild claims of Ma Bell and her friends that gloom and doom will result from this "terrible FCC-fostered" competition.

In one of the latest not-so-thinly-veiled threats, a telephone industry executive has warned phone rate increases resulting from competition could make the oil and gasoline price increases of the past few years seem like a drop in the bucket.

These kinds of scare tactics have been tried before, especially by the energy utilities to justify exhorbitant increases.

And while the telephone companies have been wailing about the evils of competition, the Bell System became the first U.S. firm to earn $1 billion in a quarter. All this as the Data Transmission Co. (Datran) was living through its final days of providing a digital service alternative to users. These don't seem to be clear and present signals that Bell has done much suffering at the hands of its wicked competitors.

The telephone industry should be given every opportunity to document its case for the Reform Act before Congress. But the legislators must insist that both sides produce conclusive evidence to support their positions.

If the phone companies are not able to document the dire consequences on which the framework of the proposed legislation is based, the entire concept of this bill should be thrown out once and for all.

Bell has been waging this battle unsuccessfully in any and all available forums for several years without success. This last-ditch effort has now reached the halls of Congress with support from many members for an open discussion of the issues.

If the legislators sincerely want to evaluate this legislation, which attempts to wipe out an inspiring industry, they should not be afraid to step forward and oppose the bill.

The telephone industry has cried wolf for long enough. This week begins its last chance to unequivocally prove its point — or forever hold its peace.

'Sorry, No Refunds . . .'

Letters to the Editor

Slick, White-Collar Ripoff Demonstrates Lax Data Security

The escapades of six alleged peddlers of good credit ratings [CW, Sept. 13] once again reminded everyone, both computer professional and layman alike, how woefully lax are the security arrangements protecting highly sensitive data in many large data banks.

In this slick, white-collar ripoff, individuals with poor credit histories are alleged to have paid fees ranging from $300 to $1,500 to have their credit reports altered to reflect excellent credit track records.

Not only did this purported scheme last almost a year, from August 1974 to the end of March 1975, but it also only required the willing cooperation of a sole female clerical employee of the credit bureau.

For these alleged shenanigans to have lasted so long and to have been so easy to perpetrate is downright appalling, especially when you consider that the victimized credit bureau maintains files on about 50 million Americans.

Since so many individuals are exposed to so much potential harm, stricter regulations should exist to demand better safeguards for the private data files of millions of unwilling and/or unsuspecting Americans.

Thomas Wong

New York, N.Y.

Pessimism Not Shared

I agree with the importance of retaining a suitable environment for the smaller entrepreneurs, but I don't share *Computerworld*'s pessimism about our shrinking numbers as stated in the editorial of Sept. 13.

Cheaper computers are bringing about a quiet second revolution in DP and opening up a ripe field for competent software professionals. With computers sold off-the-shelf in many cities, it is hard to imagine any area in our life where personal computing will not have reached by 1980.

Small- to medium-size businesses can now afford their own in-house systems and, as far as present users are concerned, it's about time they woke up to the fact decentralization and on-line systems using minicomputers are the key to effective DP.

As with many other problems, better education would cure a variety of ills and this is where IBM's competitors should spend a few of their advertising dollars.

Andrew W. Beretvas
General Manager

Minicomputer Technology
Berkeley, Calif.

No Such Language

It appears that Miles Benson [CW, Aug. 23], Jonathan Sachs [Sept. 6] and Michael D. Shapiro [Sept. 13] are utterly confused. As far as I know, there is no programming language named Snobol 68.

There is, however, a language called Algol 68 and Benson's original remarks sound very much like the comments made in some circles about Algol 68 (which was indeed implemented in England, at the Royal Radar Establishment in Malvern).

The categorical remark by Sachs that "someone with a vested interest smothered [Snobol 68] under a dollar-scented blanket" is probably pure guesswork.

Though I'm far from being a Snobol 4 expert, I think Shapiro's defense of Snobol 4 made a lot of sense. The only problem is that he was defending the wrong language.

Francis Pardo

New York, N.Y.

Data Past

Five Years Ago
Sept. 29, 1971

NEW YORK — After more than 15 years in the business, RCA dropped its general-purpose computer line with an announcement from Robert W. Sarnoff, RCA chairman and chief executive officer. RCA dropped out of the business, Sarnoff said, because studies indicated it would have to invest an additional $500 million in the Computer Services Division between 1971 and 1976 to make it a viable operation.

Eight Years Ago
Sept. 25, 1968

WASHINGTON, D.C. — The Federal Communications Commission reaffirmed a previous ruling making the tariff on foreign devices attached to the telephone network unlawful. AT&T formally filed a new tariff which was to take effect Nov. 1 and provided for the attachment of customer-owned terminal devices through a $2/mo telephone company protective device, but which still restricted the general interconnection of customer-provided communication systems with the telephone network.

— — —

MAYNARD, Mass. — Digital Equipment Corp. introduced a time-sharing system called the Time Share-8 based on its PDP-8/I CPU and designed to allow a user to call up a CPU from a teletypewriter terminal for backup when necessary. DEC estimated it could provide multilingual services with the system for educational and industrial applications at between $2 to $3 per terminal hour.

The German Dilemma

This is the last of a series of columns on Europe-at-the-computer-crossroads. I could go on with Italy, Holland and all the way to Yugoslavia; computers are vital everywhere, and every country wants to make some sort of entry. In some nations the urge is as primitive as the one which in Africa leads to Zambia Airways; in others, there is justified pride in early and original contributions – Denmark is a case in point. And of course, as data processing and computing and data communications edge up toward two or three percent of national expenditures, questions of trade balance begin to be important.

Germany – and of course I mean only West Germany; the Communist adventures could be on another planet, as far as CW readers are concerned – has a fascinating and complex pattern. Like England, and unlike France, there was pioneering invention; Konrad Zuse, along with Bell Labs and IBM men, conceived and built relay calculators forty years ago. Unlike either country, but like Japan, Germany built from an erased economy, with new facilities and a dedicated work force. And like America, there was in Germany a tradition of applied science and advanced technology, in separate institutes as well as in the universities. They did not, and do not easily even today, permit easy migration between the institutes, technical colleges ("high schools") and universities, and industry. That has worked to their disadvantage, and a glance at smaller countries like Austria, where brilliant computer people had to wear several hats of necessity – had to be teachers and researchers and entrepreneurs all at once – shows that intermingling pays.

But Germany is large. German traditions, although not terribly old, are rigid. Young people, as in Britain, find themselves assigned to educational tracks – three, in Germany – quite early on, and cannot easily trade up. The eclectic nature of early computer application made imaginative adventures possible on the user side; a young mathematical physicist named Wenke did great things for BASF, until they discovered he had a wrong degree (that is, not a doctorate in chemistry or chemical engineering). Punched card people at mail order houses and department stores beat out their American and Japanese counterparts at order entry and inventory control, until our B-school kind of highbrowism slowed them down.

But on the hardware side, tradition prevailed. Zuse's company, which could have been another DEC, was brushed aside. Attention went instead to the industrial giants: to Standard-Electrik-Lorenz, to AEG and Telefunken and finally to Siemens. SEL bid for the Air France reservation system, and botched it. AEG played footsie with our GE – two babes lost in the IBM woods. Telefunken tried to build big scientific machines, with encouragement from the appropriate ministry, which promised the product to the universities and *forschungsgesellschaft*, and got all tangled up. I remember looking at one of their developmental tape drives at Lake Constanz in 1962; great, if you wanted to employ watchmakers. At CDC, Tom Kamp was selling direct drive; simple, sturdy and fairly cheap.

And Siemens? Well, they had an advantage over the others: a vigorous young executive who understood the business. Heinz Gumin, his name was, and he came to the Eastern Joint in 1958 and told us about plans for the 2000 series. The RCA license must have been under negotiation too, but of course we didn't know that.

And now I come to the German problem. Unlike the French and the English, and some years before the Japanese, they decided to go the Big Company route. Perhaps it was a function of the time; in the United States, RCA and GE were the newsworthy entrants. In the next decade, it would have been DEC; in the Seventies, the LSI houses; the German course was set in the mid-Fifties.

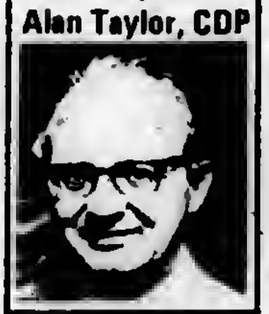
To sell against the Gray Giant, even close to home, requires vast gobs of capital. Siemens has put in perhaps $900 million, of which about $200 million came directly or indirectly from the government. Of course they have created a valuable asset base: patents, lab and factory installations, machines on lease and rental. But there looks to be no end in sight. How long will the directors of a diversified company keep on pouring money into the computer shop, when they get far greater returns from other products?

Europe indeed has its dilemmas!

Herb Grosch

Overbooking Victimization Ignored But Measurable

The Taylor Report
By
Alan Taylor, CDP



The article "Airline Overbooking Exemplifies Classic DP Problem" [CW, Sept. 20] was written prior to rejection of the idea proposed by Delta Air Lines and other airlines that the public should be informed about overbooking through insertion of a notice in the tariffs. It was also written before the appropriate authority suggested what publicity it would approve.

Presently, the Civil Aeronautics Board (CAB) maintains passengers should be directly informed of the deliberate overbooking of confirmed seats by means of large notices. Regardless if this is actually done, the possibility of such action does have some obvious effect on the current use of computer-optimized systems – and some unobvious ones also.

The person denied boarding will now know the reason for this action was not some computer error, as used to be the standard cover-up, but instead a clear-eyed, deliberate policy by the airlines to follow computer suggestions.

This will probably cause the victimized passengers to be more insistent about being appropriately compensated and less inclined to settle for some off-handed application of the current CAB rules. Some may even be prepared to take matters to the Supreme Court, as Nader did with Allegheny Airlines.

With this possibility a real one, no solution that preserves overbooking as a policy can be regarded as stable, even though it may be implemented by every airline and approved by the CAB.

Potential Victims

The potential victims – every single passenger – will evaluate their own position with the same lack of moral scruples as evidenced in the airlines and many may start or continue to book defensively. This can be quite effective, and has provoked numerous counterefforts by the airline computers which must be costing a pretty penny.

There doesn't seem to be any way to defeat this quite natural attitude. (See box). Overbooking is causing no-shows, which launches another attack on the basis of the computer simulations and the justifications urged.

The basis of the airlines' argument is that in view of the claimed 10% to 15% of travellers who alter their travel plans without informing the carrier, overbooking must be practiced to minimize airfares. No-shows are the cause and overbooking is the effect. It seems logical, but not when defensive booking is being practiced by the passenger.

Because the airlines refuse to provide anyone with a genuinely confirmed reservation, passenger defensive booking results in multiple bookings. The first available seat is used and the others become no-shows. Here the overbooking is the cause and the no-shows are the effect.

This means the apparent no-show figure is made up of some real no-shows and some secondary ones caused by the airlines solution. The numbers of each are not known, but it can be confidently predicted that the rate of increase of secondary no-shows is currently increasing much faster than genuine no-shows. So, now the problem is snowballing.

Victimization Measurement

So much for the current situation from the system viewpoint. These parts are obvious. What is not so obvious is that the power to change the system from outside is based on characteristics not currently noticed in the computer simulation. The points that measure the amount of individual victimization are simply not available, yet the possibilities can be measured.

Clues as to what the measurement is are shown in the Nader case. Here the measurement involved:

- The lack of notice to Nader.
- The number of people waiting for Nader.
- The difficulty or impossibility of rescheduling.
- The unavailability of alternative routes.

The first and last are known or capable of being known by the airlines. The second and third, however, are not and they will effect the measurement of victimization by computer optimization very considerably.

Provision must be made for these by providing genuine reservation systems to at least some seats. Total overbooking systems are almost certainly doomed, and will soon follow the unpublicized-overbooking era that has now ended.

The measurement of knowable victimization levels will have to be introduced into the continuing partial-overbooking systems. More aggressive methods will also be needed to reduce the number of overbooking victims. This practice has not been directly addressed by the airlines in their publicity campaigns. Yet here is one of the major areas where computer simulation can – and should – help.

The possibility of such aggressive operations will be discussed in the next column. I welcome any ideas you have as to how computer use can minimize refused seats. Till then, remember what is happening here is not a unique scenario, but is the anticipatable life cycle of many computer simulations and optimizations. So, if you are involved in planning or evaluating any such applications, review the situation with these factors in mind.

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How to Get a Safe Seat

Under current systems there are at least two methods of defensive booking which will provide genuinely confirmed seats. Method A provides confirmed passage by an outside time limit and is usable if the traveler has time to squander at the airport. If he doesn't, Method B can be used.

Method A. Two-Flight Booking

The traveler books on an available, earlier flight as well as on the flight that will get him where he wants just in time. He leaves enough time between the flights to compensate for having to go from one gate to another plus about 45 minutes. This way he is one of the first to board (having taken his seating position carefully) and can guarantee the second seat if he is bumped off the first.

Cost: Passenger time and one no-show per use.

Method B: Neutralization Bookings

Where the traveler cannot afford the time required by Method A or where the system simply doesn't have later flights, he can change the pseudo-confirmed seats issued by the airlines to genuinely confirmed seats (for himself and others on the flight) by reserving sufficient seats that will use up the overbookings.

Cost: Many no-shows per use.

Letters to the Editor

How Many Will Write To Defend a Pet Language?

I wonder how many Michael Shapiros [CW, Sept. 13] will write to *Computerworld* in defense of their pet language, assuming it was the one maligned in my "Snobol 68" article [CW, Aug. 23].

I'm sorry, Michael Shapiro and all you others; the article should have said Snobol 68 was a pseudonym, uncleverly disguising the real name of the language (which was not Snobol 14, Michael).

Guess again, anyone?

Miles Benson

Seattle, Wash.

Important Role Overlooked

I think the article "Responsibility of DPers Cited in Keeping U.S. Cities Alive" [CW, Sept. 6] reported some unbalanced statements. I agree DP persons responsible for government information systems have a definite role in keeping these systems effective and reliable, but Sugarman seems to overlook the equally important role of government leaders and executives.

Most conscientious DP personnel know the frustrations of trying to develop information systems for executives who are unable or unwilling to aggressively direct the development of these systems. These people only get involved after the systems are developed, and then they expect it to deliver all the information they want.

Government leaders and executives must eventually understand that the key to good information systems development is a complete, systematic definition of the requirements of such a system with full participation and direction by these leaders. Making DP personnel the scapegoats for every system inadequacy is no way to improve these systems.

Government leaders and managers must share equally if there is any blame to be assigned. They must share in real participation in the development of these systems.

John R. Murphy
Director
Division of Management
Services and Systems
Human Resources Administration
City of New York
New York, N.Y.

Shortcomings Exemplified

As a long-time student of psychology and data processing, as well as a resident of Atlanta, I read with some interest the article, "Psychological Reasons Hindering EFT Acceptance" [CW, Sept. 13]. Leonard L. Berry's comments are a prime example of the serious shortcomings of universities and professors – a lack of experience in the real world.

I see automatic teller machines (ATMs) everywhere I go in Atlanta and the Southeast and I find them convenient and easy to use. My bank, Trust Company of Georgia, has 15 or 20 ATMs installed and the proximity of an ATM to my home was a primary reason for selecting my bank.

While not specifically electronic funds transfer (EFT), a consortium of banks in Atlanta has initiated an on-line check approval system using plastic, magnetically-encoded cards.

While there may be few ATM operations that have broken even, the First National Bank of Atlanta has one of the most successful ATM programs in the U.S.

If the EFT industry is not rushing toward overextending its capabilities, then more power to it.

Stephen Crane

Atlanta, Ga.

In Praise Of Pride

I wonder at the fact that in publishing my letter to the editor [CW, Aug. 30] you have deleted the initials CDP from my signature. I have a great deal of pride in being a Certified Data Processor, and as a member of the board of directors of the Institute for Certification of Computer Professionals, I am particularly saddened at *Computerworld's* insensitivity to a growing feeling of professionalism in DP.

Perhaps my monumental ego is trapping me into making a mountain of a molehill, but damnation! Pride in one's work is at the core of my original letter.

The day I can't take pride in what I do, I'll shine shoes for a living.

James M. Brown

Chicago, Ill.

System Must Deter Misuse

The discussions of computer theft by phone in *Computerworld* emphasize once again the ease of employing the telephone for misdeeds.

The Massachusetts problem of determining whether a wager placed by telephone is legal (intrastate) or illegal (interstate), the problem of the widow receiving a crank midnight call, the use of phones by terrorists to extort their demands from the public and computer theft by phone all have one item in common: the anonymous nature of the active party (the caller) and the unanonymous nature of the passive party (the party telephoned).

The logic of a system which allows the active party, who is invading the privacy of others, to remain anonymous is highly questionable.

It would appear that a simple way of eliminating much misuse of the phone system would be to require the phone companies to utilize the circuitry which transmits the telephone number of the calling phone to the phone company's billing system to simultaneously transmit this number (all 10 digits) to the phone called.

An option should be offered to the public which would employ a 10-digit numeric display similar to those of today's inexpensive pocket calculators and would display the telephone number of the calling phone.

Such a simple device could greatly reduce harassment by phone and would reduce one of the current major advantages of the electron thief – his anonymity.

John F. Cain

Bridgeport, Conn.

Easier Maintenance Sought

Regarding the letter from Anita Benson [CW, Aug. 16] on creative programming, we have recently adopted structured programming. Our objective is to stop developing creative programs that are extremely difficult to maintain.

I do not believe structured programming and creativity have to be mutually exclusive. There is still a great deal of room (and need) for creativity in the design of systems, programs and in programming techniques. However, the purpose has to be to satisfy the user and this requires programs completed on schedule, error free and easily modified.

Data processing has progressed to the point where acceptable performance requires more than simply getting a program to run.

Mike Murnane
Systems Manager
Management Information Systems
Shaklee Corp.
Emeryville, Calif.

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Three Areas of Danger

Software Tools Being Used for Wrong Reasons: Mack

By Don Leavitt
Of the CW Staff

LONDON – "We software people have dragged the hardware engineers down to our level," Edwin S. Mack charged in keynoting the recent European Computing Congress (Eurocomp) here and commenting on the questionable uses of the tools developed in computer performance evaluation (CPE) and software projects.

The classic engineer has the skills needed to provide an objective analytical view of a problem under study and to add some value to whatever he does, the director of product development at International Computers Ltd. (ICL) said.

By contrast, the project manager in a data center has – or should have – a far more pragmatic view, he added.

The pragmatist would see the use of a computer in most instances adds nothing of value to the work being done; rather, the computer's primary reason for being is to cut the overhead required to handle a job that must be done, regardless of the means, he explained.

The technicians who are now sometimes called software engineers have provided some tools useful in cutting back on the overhead needed to produce and maintain "useful" software programs. Beyond that, the CPE professionals have added a range of tools intended to help the manager make the data center actually work more efficiently, he said.

CW
At Eurocomp

But the managers themselves seem to have a variety of reasons for using the tools, and there are various pitfalls lying in the path of those who use them unwisely, Mack warned.

Some use the tools to avoid trouble. They realize it is hard to manage a project if its design is poor, for example, or if the hardware system is the wrong size for the workload, he went on.

Others use the tools to minimize the resources needed to get a job done. This might have a pay-off in staff productivity on the one hand, or longer life for a hardware system on the other, the ICL official noted.

Still other users see the tools as aids to implementation, he said, adding this seems to be particularly true in the area of acceptance testing.

Almost as an aside, he commented on the view still held by some that programming is an art form: "Personally, I've long held to the motto 'Never let the best get in the way of the good.' Recently a colleague carried that pragmatic approach one step further: 'Never let the good get in the way of the acceptable.' "

There are other reasons people use the software engineering and CPE tools, he said, but they aren't good reasons. These reasons include "just plain curiosity," an attempt to win an argument or a try at using the tools which are apparently the "in thing."

An experimental approach or the use of the tools to provide "busy work" for a staff that has little development work may be either good or bad reasons for using the tools; Mack left that choice to the 300 delegates who heard his talk.

In any case, he warned, "after much study, it now appears there are three areas of danger in the use of these tools – before, during and after implementation of a new system."

As a project is taking shape, the jargon and the definition of terms – often meaning different things to different people – is the first pitfall, according to Mack. He mentioned, as an example, how a friend had reported to him that "our commitment was 12, but we're going to be able to do eight."

Thinking about some bugs the team had

(Continued on Page 24)

'Fuzzy' Kiviats Proposed for Management

By a CW Staff Writer

LONDON – The idea behind "conventional" Kiviat graphs is to provide nontechnical management with a picture of how well their computer systems are performing, but the pictures produced really are not comprehensible to the intended users, according to a Mitre Corp. analyst.

Speaking at the recent European Computing Congress (Eurocomp) meeting here, Jim Elliott said the classic Kiviat graph is at once too specific and too imprecise to be acceptable.

The only picture management can really appreciate is that produced on a "fuzzy" Kiviat graph, Elliott said.

The original Kiviat graphs, he explained, are circle charts with an undefined but even number of spokes radiating from the center. The spokes are used to plot the ratings of "good" and "bad" individual performance indicators.

The problem with that is two-edged, Elliott continued. There is no agreement on what indicators are "good" or "bad" or which should be used, nor any agreement on the meaning of the various patterns produced by this unstabilized vehicle.

In place of the "stars," "sails," "keels" and other general shapes some have identified in connection with Kiviat graphs, Elliott proposed a presentation scheme combining parts of the Kiviat approach, parts of the "fuzzy set" theory of mathematics and parts of a general system theory embodied in a diagramming scheme called the Resource Planning and Management System (RPMS).

Elliott's fuzzy Kiviat graphs retain the basic circular form of the original graphs, but the scaling of RPMS elements that make up the patterns produced is three-part (good, fuzzy and bad) rather than a continuous spectrum; individual elements are not plotted at all.

Working with the principles of interval

(Continued on Page 24)

Graph's Originator Reacts

LONDON – A mixture of emotions could be sensed in the voice of Phil Kiviat when he told a European Computing Congress (Eurocomp) technical session his reaction to the "fuzzy" Kiviat graphs suggested by Jim Elliott of Mitre Corp. (see accompanying story).

The technical director of the U.S. Federal Computer Performance Evaluation and Simulation Center said he had come up with the original idea for the charts that now bear his name, but really all he did, he said, was adapt the chart used by doctors to visually illustrate a patient's life signs to represent the life signs of a DP system.

He saw the DP-oriented version as easier for managers to grasp than the pageful of numbers most monitoring or job-accounting systems generate.

Kiviat was particularly concerned about Elliott's attacks on the so-called requirements of conventional Kiviat graphs. Admitting he had visualized the use of radii as plot points for performance indicators, he said he had not set up the rule that there had to be an even number of axes.

Although he generally agrees with the idea of the even number of indicators and with the corollary that they should be alternately "good" and "bad" indicators, Kiviat said it was others who had imposed those prerequisites.

As long as a consistent set of indicators is used and each is in the same position around the circle from graph to graph, a manager can see if and how performance has changed from one plot period to the next, Kiviat explained.

The basic shape, rather than any "figure of merit" that might be derived from it, would "tell" the manager if there was a slew in an undesirable direction or a recovery from a previous problem, he added.

Conference to Compare 24 General-Purpose DBMS

LOS ANGELES – Twenty-four general-purpose data base management systems (DBMS) will be compared at a four-day conference at the Ambassador Hotel here Oct. 19-22 sponsored by the Extension Division of the University of California at Los Angeles (UCLA).

Designed for prospective DBMS users, the conference will feature presentations by representatives of the firms that developed each system.

In addition to providing prospective users with insight into the general areas of the software and services industry, the conference will also feature comparative evaluations through "hands-on" testing of sample data bases accessible to terminals, according to a UCLA spokesman.

Conference events will run from 9 a.m. to 7 p.m. daily. To allow for the differing requirements of those participating, the conference will include parallel sessions on minicomputer-oriented systems and midi/large systems, he added.

Firms that will be represented include Burroughs Corp.; Cincom; Computer Corp. of America; Control Data Corp.; DBMS, Inc.; Data General; Digital Equipment Corp.; ELS Computer Engineering; Forth/Cybek; General Electric; Honeywell Information Systems; Hewlett-Packard; IBM; Infodata; Informatics, Inc.; Mathematica, Inc.; Meade Technology Corp.; MRI Systems Corp.; Microdata Corp.; National CSS; Software AG; TRW, Inc; Univac; and the University of Windsor.

Cost of the conference is $325/person. Additional details are available from the Management, Labor and Business Department, UCLA Extension, P.O. Box 24902, Los Angeles, Calif. 90024.

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'The Librarian' Now Available For IBM 360/370 VS Users

PRINCETON, N.J. – Applied Data Research, Inc. (ADR) has introduced a version of The Librarian, its source program management system, for IBM 360/370 users running under VS.

The Librarian/VS contains all the features and facilities of The Librarian, and the two systems are currently identical from a functional point of view, an ADR spokesman noted.

Additional Features

Additional features of the VS version include reduction of loading frequency because of a residency feature and a corresponding reduction in the amount of I/O to the load libraries, ADR said.

The Librarian/VS uses up to 20% less CPU time than the standard Librarian; the total number of I/O operations can be up to 35% less; all out-paging is eliminated; and in-paging is reduced, ADR claimed.

The program is fully reentrant, the spokesman added.

Restructured Version

The VS version has also been restructured to minimize the size of its working set; to achieve minimum amounts of paging, the logic and data areas most heavily used in close proximity, the company said.

The system is constructed to operate in the Pageable Link Pack area of any VS operating system.

One Copy Per Site

All users of The Librarian/VS at an installation share the same copy, which is loaded only once at IPL time, the company said.

The permanent license for the VS1 and VS2 versions of the system is $5,800; the DOS/VS license costs $4,900 from ADR at Rt. 206 Center, Princeton, N.J. 08540.

Correction

Hewlett-Packard Co.'s HP 2641A CRT terminal, introduced with the APL 3000 standard language package for the company's HP 3000 Series II CPU [CW, Sept. 20], costs $4,100 with 4K bytes of memory and $5,700 with memory and tape cartridge transports.

'QLP 1100' Gets Report Writer

BLUE BELL, Pa. – Univac has extended its Query Language Processor (QLP 1100) to broaden the application range of this interactive interface to DMS-1100 data bases.

The Level 2 release provides a set of report-writing facilities in addition to the Level 1 retrieval capabilities.

The report writer enables end users to specify the appropriate format for "practically all types of data base reporting requirements," a spokesman noted. Presentation groups can be associated with detail groupings, control headings and footings, page headings and footings, report heads and footings and a message page, he added.

Information can be retrieved from the DMS-1100 data base with the report writer by item name even when the inquirer is unaware of data base storage structures or access methods employed in the schema, Univac said.

While items referenced can reside within different types of records within the data base, those records may be logically related in the schema, according to the spokesman.

QLP 1100 Release 2, available now, is free to users of the 1100 series operating systems software. Univac is at P.O. Box 500, Blue Bell, Pa. 19422.

'Fuzzy' Kiviat Graphs Suggested for Non-DPers

(Continued from Page 23)

mathematics, Elliott said he determines maximum and minimum values for each element, averages them and plots the averages in circular form around the center point.

The resulting pattern has varying diameters, depending on the "goodness" of the system, and varying center "holes," depending on the "badness" found.

General Conclusions

In general, the greater the outside diameter, the better the system being plotted, but a wide hole in the middle indicates some weakness in the system. In any case, Elliott noted, the total area of the circular figure between the maximum and the minimum values is a reasonable figure of merit for the system being plotted.

Since these patterns are always built up from the same parts of the RPMS that describe a system, he said, they can justifiably be used to compare the performance of two or more systems when each is proposed as the solution for the same problem.

Or the fuzzy Kiviat graph might be used to show how the performance of a single system has changed over time, he added.

If his basis is valid, Elliott concluded, the newest variant of the Kiviat graph overcomes the weaknesses of the original. It offers a simple pattern that managers can understand and feel comfortable with, it avoids arguments – usually among technicians – as to whether a specific performance measurement is "good" or "bad" and it provides the basis for comparative single figures of merit.

Software Tools Used Unwisely

(Continued from Page 23)

been trying to resolve, Mack wasn't pleased by this report or by the smile on his colleague's face until he realized his friend was talking about how the team had cut four seconds off the response time to a typical transaction – and not about bugs at all.

Even the right tools can get in the way during the design phase of a project, he pointed out. "There is no substitute for thinking," he noted. And, of course, use of the wrong tool could be disastrous, he added.

During implementation, a user can sometimes fall into the trap of depending too much on the computer to "miraculously" resolve or at least identify all his problems. Or he will leave debugging code in a program after it's all "clean" – and then wonder why it runs longer than it should or takes more memory, Mack said.

After implementation, measurement results are still susceptible to misinterpretation, so users aren't immune to pitfalls even at this stage of a project, he warned.

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With Run Time Parameters

Sectioning Base Array Voids Fortran Size Problems

By Bruce Weinstein

Special to Computerworld

The storage control features built into PL/I are not present in standard Fortran. In almost all cases, it is impossible to write non-restrictive code that requires minimum storage without some kind of an array overlay procedure which allows reuse of storage areas not needed for the duration of program execution.

Concepts and Techniques

We have developed techniques which overcome these shortcomings and which may be implemented on existing Fortran programs to gain flexibility.

The rigidity of common Fortran coding is illustrated by a common request – to modify an otherwise satisfactory program to enlarge the dimensions of an array buried somewhere inside one of its subroutines.

When the program was designed the question of individual array size probably surfaced and at that time no one thought it could possibly grow beyond its design value.

In fact, the question of array size need never be asked by the designer.

All Fortran programs may be organized so that arrays with varying capacities are grouped as subsections of one large array accessible from the main program. The size of this large array is solely determined by a five line subroutine which may be recompiled at the user's convenience.

The large array and its length are stored in a COMMON area which is included in the main program and the five line SIZE module:

```
 SUBROUTINE SIZE
 COMMON/MEMORY/LENGTH, BLOCK
(NNNNN)
 LENGTH = NNNNN
 RETURN
 ENO
```

NNNNN is the capacity of the large array in words.

The sizes of the individual arrays (subsections of the large array) are calculated from parameters read in at execution time. These calculations must take into account whether the arrays are to be addressed as half-words, full words or double words in the subroutines called. Thus the large array element which is the first element of each individual array can be calculated.

Since Fortran passes only the address of an array in a subroutine calling sequence, the calling sequence need only contain the array element of the large array where the individual array begins.

The main program needs components to receive the array allocation information, to calculate the pointers to the large array subsections, to determine if there is sufficient space in the large array for the subsections and to direct the flow through the program according to options read in at execution time.

The main program uses NAMELIST input to pass the allocation information:

```
 COMMON/MEMORY/LENGTH, BLOCK(1)
 NAMELIST/OPTION/NA,NB,NC,NO
 CALL SIZE
 REAO (IN,OPTION)
 LB = LA + NA * NB * NC
 LC = LB + INT ((NB+1)/2.)
 LO = LC + 2 * NB * NO
 LMAX = LO + NA - 1
 IF (LMAX.GT.LENGTH) STOP
 CALL SUB1 (BLOCK (LA), BLOCK (LB),
BLOCK (LC), BLOCK (LO), NA,NB)
 LE = LC
 LMAX = LE + 2 * NC - 1
 IF (LMAX.GT.LENGTH) STOP
 CALL SUB2 (BLOCK(LA), BLOCK (LB),
BLOCK (LE), NA, NB)
 STOP
 ENO
```

The array subsections are arranged to reflect how long through the program flow the information contained in the subsection is to be retained. Subsections that contain information no longer needed may have the memory space that they occupy overlayed by subsections (not necessarily of the same size) needed by other subroutines.

Subsections that are never overlayed are equivalent to static storage in PL/I. Overlayed subsections simulate PL/I automatic storage.

One-dimensional arrays contained in the calling sequence need only be declared to have a dimension of one in the called subroutine since the space requirements for the array have been allocated in the main program. Except for the last dimension, multi-dimensional arrays need all dimension information declared either explicitly or implicitly. This is necessary because the subroutine needs to know how to address the subsection allocated to it.

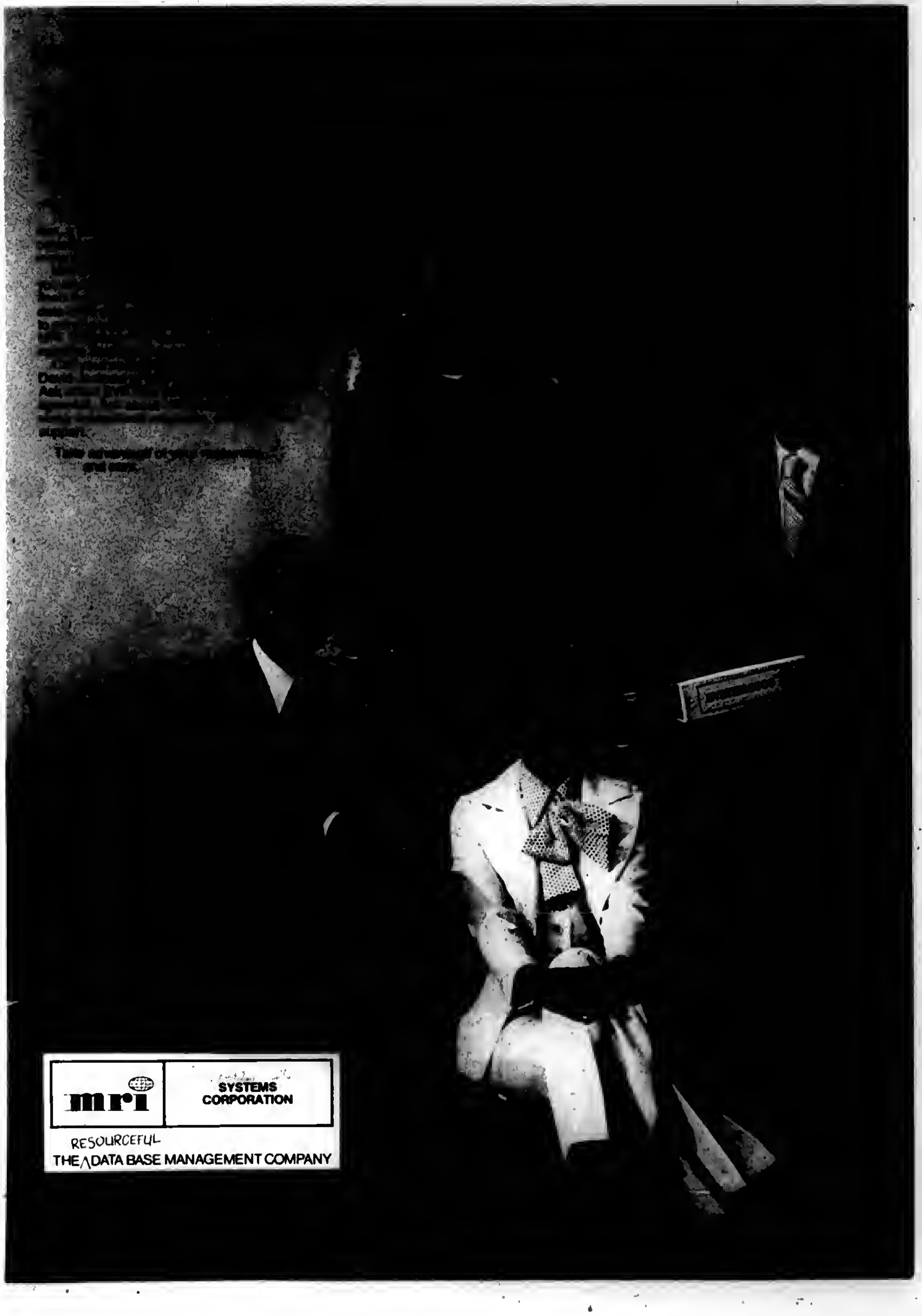
Implicit dimension information can be passed in the subroutine calling sequence as is done in subroutine SUB1 which is called by the main program above:

```
 SUBROUTINE SUB1 (A,B,C,D,NA,NB)
 INTEGER* 2 B
 DOUBLE PRECISION C
 OIMENSION A (NA,NB,1), B ( 1), C (NB, 1),
O (1)
 ●
 ●
 ●
```

Since the arrays are part of the calling sequence, no memory is required for them in the subroutine other than the word required to pass the address of the first element.

Any existing Fortran program can be easily modified to incorporate these techniques by adding the required features: Expand the subroutine calling sequences to include arrays for which variable dimensions are desired, calculate the large array pointers to the individual arrays in the main program and pass these, together with any object-time dimension information, to the subroutines.

Bruce Weinstein is an environmental scientist with the County Sanitation Districts of Los Angeles County, California.



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EEO Commitment Can Erase DP's Anti-Women Bias

The Human Connection

By Barbara C. McNurlin
Special to Computerworld

U.S. law says there can be no discrimination in employment based on sex. But companies are finding it unpalatable to comply with this law in more than a token manner.

The result has been a number of massive court-ordered settlements by companies that thought they were complying with the law – settlements of hundreds of thousands to millions of dollars.

The Equal Employment Opportunity Commission (EEOC), which is charged with enforcing compliance with the federal Equal Employment Opportunity (EEO) laws, states that since the passage of these laws in the mid 1960s, *overt* discrimination by individuals against individuals has declined. Today, one person is not so likely to consciously discriminate against another person.

However, *systematic* discrimination is still occurring in employment practices. Systematic discrimination results from the seemingly neutral employment practices that unintentionally perpetuate discrimination.

The identification and elimination of systematic discrimination are the major focus of EEOC's efforts today. To this end, the courts have ruled that it is the consequences of employment practices, not the intent, which determine whether discrimination exists that requires remedial action.

How much sex discrimination exists in DP? There seems to be mixed reports on this. Statistics show few women are in computing management but, at the same time, some women in the field report having felt no discrimination.

DP is not a traditionally female or male profession; it has always been open to men and women. Since entry-level jobs are accessible to women, they do not feel the need to be "noisy" about the need for change.

In this type of profession, women are more likely to work through the system to break down treatment barriers that inhibit upward movement within the field. Some women, in this situation, may not even be aware of discrimination.

In 1971, T. Levitan reported on the discrepancy between working women's perceptions of sex discrimination and objective discrimination that actually exists. In a national study of 539 working women, she noted, only 7.9% reported having been discriminated against in any way on their job because they were women.

In actuality, Levitan found, there was evidence of discrimination against 95% of these women.

Levitan surmised the reasons for this discrepancy were many. Possibly the women rationalized an unpleasant situation, or maybe they compared themselves to other women rather than to men. Maybe they felt that men *should* receive more occupational rewards, or maybe they recalled only overt discrimination.

Whatever the reasons, Levitan concluded objective discrimination was unrelated to perceived discrimination.

Although there appears to be little salary discrimination against women in the computing field, based on the studies we have seen, there *is* systematic discrimination. There are few women in the higher positions in computing, the result of company personnel practices as well as cultural attitudes.

Many authors have commented that changing the laws is not enough to effect equal employment opportunities for women. Other, more intrinsic, changes must occur within the organization structure and with employee attitudes in order for a successful equal employment opportunity program to exist.

These changes must occur on three corporate levels:

- Create a positive corporate environment.
- Resocialize men's attitudes.
- Train women for management.

The single most important ingredient for creating a positive corporate environment is top management's genuine commitment to EEO. Without this, even the most receptive EEO officers and middle managers will have no luck promoting women – and, in addition, will probably get themselves into trouble.

Once the commitment is there, top management must make sure there is continued commitment down the line. This is no easy task because the ranks of middle management is where many subtle discriminatory decisions are made. So management must implement a program to monitor the actual compliance by managers.

To change a person's attitudes directly, it is necessary to get the person to see and understand the basis for these attitudes. This is basically what awareness training for managers is all about – resocializing men's attitudes. Awareness training sensitizes line managers to their traditional attitudes that form subtle barriers to EEO.

This is not to say that only men form these barriers; women managers also have attitudes which prevent them from making objective decisions about women subordinates. But male managers seem to be less aware of these preconceived generalizations than women.

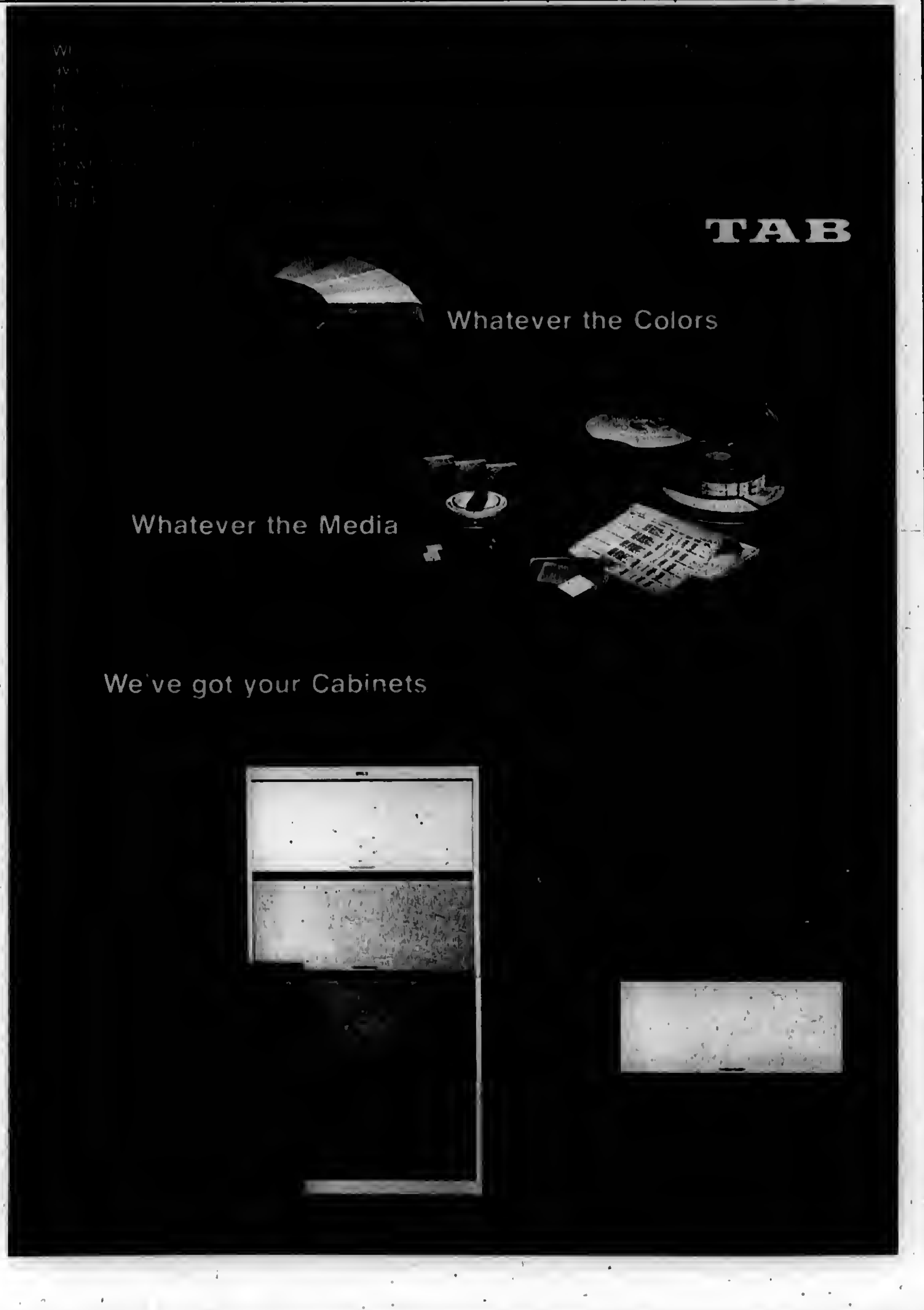
Instituting resocialization programs for middle male managers is an important ingredient for successfully bringing women into management. Further, it is one approach few companies are taking.

In the area of equal employment opportunity, the next 10 to 15 years will be painful because of the social change that must take place. Corporate structural systems and cultural attitudes are the basis for sex discrimination, and these are not easy to change. Management on all levels must take the approach that will be to the company's benefit.

Putting qualified women into management positions is not only an obligation, it is a positive action that will become an asset to any company.

This article is an excerpt taken from the August 1976 issue of the EDP Analyzer, *entitled "Bringing Women into Computing Management," which is available at $6/copy from Canning Publications, Inc., 925 Anza Ave., Vista, Calif. 92083.*

McNurlin is a member of the staff of the EDP Analyzer.



Data Briefs

Kent Switch Unit Features Cable-to-Modem Connection

HOUSTON – Kent Computer Corp.'s KCC-232 Communications Switch Unit (CSU) reportedly gives an operator the capability to connect and switch six computer communications cables to twelve modems.

The CSU supports any RS-232 connection, the company said.

Kent's Model 232A provides a lockout feature which is said to prevent operator selection of a channel modem connection in use.

Both CSUs include cable connectors for the communications channels and modem cable connectors.

The 232A costs $2,500 and the 232B is priced at $1,600, Kent Computer said from 9219 Katy Fwy., Houston, Texas 77024.

Comdata Has Acoustic Coupler

SKOKIE, Ill. – Comdata Corp. has announced an acoustically-coupled modem which provides for the transfer of data between a remote computer, a local terminal and an ordinary audio magnetic tape cassette unit.

The 302C features a carrier indicator, full- or half-duplex operation and a magnetic tape unit interface.

Storage of up to 150K characters is provided at 300-bit/sec transmission rates on standard cassettes; automatic block recording is provided when used with a buffered terminal.

The 302C costs $420 with immediate delivery, the firm said from 8115 Monticello, Skokie, Ill. 60076.

DSI Adds Paper Tape Reader/Punch

NORTHBROOK, Ill. – Data Specialties, Inc. (DSI) has a paper tape reader/punch which reportedly can attach to any terminal through the RS-232 or current loop interface.

The SRP-300 may be remotely controlled from the line or terminal through standard codes. It features full- or half-duplex operation, line/local, search/edit control, back space, tape feed and selectable transmission rates, DSI said.

The unit costs $1,995 and has a 45-day delivery schedule, the firm said from 3455 Commercial, Northbrook, Ill. 60062.

Different Net Brings Benefits

Former Datran User Finds Speedy Relief

By Ronald A. Frank
Of the CW Staff

CHICAGO – The demise of the Data Transmission Co. (Datran) has led at least one former customer to find speedy relief to his network problems.

Polysystems, Inc. had been a Datran user operating a network in Dallas, New York and Chicago. The company provides actuarial software programs to accounting firms which utilize the dual Burroughs B6700 mainframes at Polysystems' DP center here.

Polysystems had previously undertaken a study to seek alternative network suppliers, according to Guy C. Nadeau, the firm's president. The company had already tentatively decided the Tymshare network could provide expanded geographic benefits and a lower operational cost than Datran.

As a line carrier, Datran was a technically good company, but it is difficult for a small user to deal with many different vendors and it is not economical to set up an in-house network, Nadeau said.

"Datran was so much superior to the Bell Telephone System and I would still use it today if it were in certain cities," he said.

In dealing with the earlier Datran arrangement, the company encountered "unreal complexities" because many suppliers had to get involved, Nadeau said. Although no modems were required on the Datran lines, the access local loops needed data sets and required interfacing with local phone companies.

The earlier network worked well and was reliable from a technical standpoint, but Polysystems had the tasks of coordinating network arrangements with various equipment vendors and telephone companies as well as Datran, Nadeau said. Equipment included modems from International Communications Corp. and a Timplex multiplexer.

With Tymshare, Nadeau expects to have an easier time since his new network supplier will act as the main interface to see that all portions of the network are operating. For a small company such as Polysystems, Nadeau said, this is a definite benefit.

Switch Not Difficult

After being notified that Datran service would be terminated [CW, Aug. 30], the switch to Tymshare was accomplished with few problems. Tymshare installed a Tymcom processor (a special version of the Varian 620/I) and arranged for all telephone company links to the nearest Tymshare network office in Chicago, Nadeau said.

These local digital circuits will allow Polysystems to handle about 30 lines from users dialing into the Burroughs CPUs to access the accounting programs, he added.

One advantage for the company is that more customers will be able to dial into the network since Tymshare provides dial-up access in a larger area than was available with Datran. Also, with its larger network geography, Tymshare will be able to utilize alternate path routing in the event of circuit failures, Nadeau believes. Datran could not do this since its network covered a limited area.

Initially Polysystems will be paying about the same total bill each month to Tymshare as it did to Datran. But savings will come from not having the operational problems of continuously testing lines, and there will be no finger-pointing sessions between vendors, Nadeau said.

In addition, the actuarial programs for Polysystems' customers will be available in 80 cities, which will probably mean an expansion of business for the company, he added.

Polysystems' customers access the actuarial programs in Chicago using their own terminals. The B6700s support incoming data transmitted at speeds from 110- to 9,600 bit/sec.

About 18 to 20 users are accessing the actuarial programs daily and Polysystems estimated it will be using about 600 hour/mo on the Tymshare network.

Telecommunications Seen Key To Social Service Optimization

By Toni Wiseman
Of the CW Staff

LOS ANGELES – Civic and social services that have already been improved by means of DP applications are being expanded and optimized even further by telecommunications, participants concluded at a recent session at the Western Electronic Show and Convention (Wescon) here.

Consultation between a physician "provider" and a physician, nurse or patient "consumer" via an electronic communication line becomes justified, for instance, when travel of the provider to the consumer is impossible or too expensive, according to a paper presented at the session.

The paper, written by several doctors from Case Western Reserve University, asserted that even in the inner city, telemedicine can be justified where a small institution lacks specialists that are readily available in a large medical center within the same city.

"The quick consultation available through telemedicine makes accessible the highly specialized consultant on short notice without disrupting the consultant's routine activities in the large center more than would a consultation with an additional patient in the large medical center," according to the paper.

The Cleveland telemedicine network described in the paper consists of a central monitoring facility located in the university's hospital (UH) and three remote camera locations, including an operating room of the Veterans Administration Hospital (VA), an operating room of Forest City Hospital (FCH) and a mobile camera that can operate from any of five locations in the FCH (operating rooms, intensive care units, delivery rooms, newborn nursery.

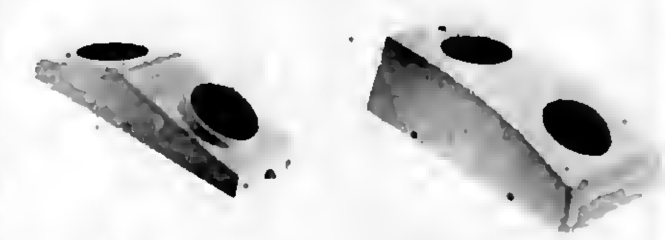
Two-way audio-video laser communication systems connect the remote camera sites to a tall dormitory building of Case Western Reserve, it noted. A closed circuit television system is used to complete the connection to the monitoring facility at UH. The camera site at FCH is also connected to the monitoring facility directly by microwave.

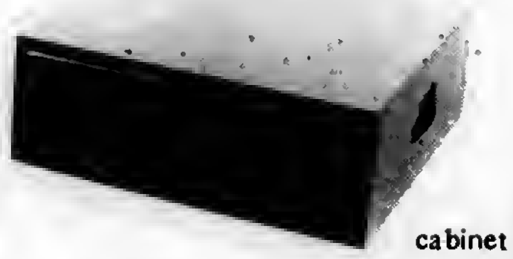
Law Enforcement

Public safety agencies are also benefiting from innovative telecommunications advances, according to Robert L. Sohn of the Jet Propulsion Laboratory at the California Institute of Technology.

Computer-aided dispatch, mobile digital communications, automative vehicle loca-

(Continued on Page 30)





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Telecommunications Seen Key To Social Service Optimization

(Continued from Page 29)

tion and direct data file access are a few of the advances this technology has made possible, Sohn said.

Others include digitized voice entry and response, the 911 emergency telephone number and rapid, comprehensive management reporting, he added.

"These innovations have come upon the scene in the past few years, but are attracting widespread interest for two reasons. First, low-cost computers, digital communications equipment, vehicle locator systems and supporting software are coming into the marketplace," Sohn said.

"And secondly, strong pressures are being exerted on public safety agencies to maintain and even improve their effectiveness under severe budget and manpower constraints, to increase the level of service to the community and to enhance the safety of their personnel," he said.

Of the several innovations in command and control, computer-aided dispatch has the most direct impact on operations within the dispatch center because a manual system is replaced with one in which all data is entered directly into a computer system, he stated.

Incident report cards, conveyor belts and manual field unit status boards are dispensed with, he added.

Among the many benefits to be derived from computer-aided dispatch are reduced response time, primarily by reducing the time between receipt of a call for service and assignment of a patrol unit; and enhanced officer safety because more information is made immediately available, Sohn said.

A typical system would include a central processor, a data base system and keyboard display terminals for complaint-board operators, dispatcher and support personnel.

The data base itself contains several files including:

- Incident records – a log of each incident from initial call to log of final disposition.
- Status of field units – a summary of the status, assignments and availability of vehicles.
- Geo- or address file – a listing of all addresses to the block level within the jurisdiction.
- Personnel – a log of personnel status and assignments.
- Dangerous situation – a file of addresses of dangerous persons and places.
- Vehicle and crime information – lists of stolen vehicles, wants and warrants, including local files, department of motor vehicles and the National Crime Information Center.

Obvious Advantages

"Computer-aided dispatch systems cannot perform functions that are not possible with conventional manual systems," Sohn stated. "But there are obvious advantages in capturing all data in real-time such that situation and activity reports are immediately available to command and control system managers.

"Better utilization of resources in day-to-day operations is certainly made possible through this capability.

"And, in the long term, a modern management reporting system provides a means or tool by which agencies can develop better strategies and procedures for use of their resources, based on more accurate and timely identification of needs; as with crime patterns," he stated.

Automatic vehicle monitoring (AVM) and Identification (AVI) are becoming increasingly important as users, such as government agencies and private firms, desire a capability to monitor hazardous, sensitive or valuable cargo in cross-country transit.

Generally, the users desire low-cost equipment, position location accuracy of less than 300 feet to a few miles, an updating rate of once very 15 minutes to two hours and a capability for instantaneous alarm in case of emergency, according to a paper jointly presented by J.S. Bravman of Fairchild Space and Electronics Co. and S.H. Durrani of Nasa-Goddard Space Flight Center.

They discussed several systems including a baseline system for highway applications in which each vehicle obtains information through a Loran-C receiver in rural areas and through a "signpost" or "proximity"-type sensor in urban areas. The vehicle transmits this information to a central station via a communication link, they said.

"In an advanced system, the vehicle carries a receiver for signals emitted by satellites in the global positioning system and uses a satellite-aided communication link to the central station," they noted.

An advanced railroad car monitoring system, on the other hand, uses car-mounted labels and sensors for car identification and cargo status. The information is collected by electronic interrogators mounted along the track and transmitted to a central station, they said.

"All these systems permit the use of low-cost user equipment which can be developed from presently available hardware," Bravman and Durrani stated. "Satellite-aided communication links from remote mobile terminals can be established for security reasons or if the system is shared by other types of applications."

A system to meet the vehicle monitoring requirements over the continental U.S. is technically feasible, they concluded, but it will require a sufficiently large market to reduce the cost of user equipment through mass production.

Modems Have Micro Technology

MIAMI – International Communications Corp. (ICC) has introduced two 4,800 bit/sec modems with microprocessor technology. The MPS 48 and MPS 48 Dial were designed to reduce line equalization time for efficiency, the firm said.

The modems equalize dial-up lines and dedicated point-to-point or multidrop lines in 26 msec while operating at 4,800 bit/sec. Conventional 4,800 bit/sec modems "generally require at least 50 msec clear-to-send time to achieve equalization," ICC said.

Remote test features are available on the units for either point-to-point or multidrop networks. This reportedly allows the user to isolate system faults from the central site without involving personnel at remote sites.

The modems are tolerant of widely varying line conditions and operate with low error rates in both dial-up and multidrop polling systems, ICC claimed.

The MPS 48 is available at a cost of $4,950 with test options and with lease plans ranging from six months to five years, according to a spokesman. A 24-month lease is $130/mo, he added.

ICC is at 8600 N.W. 41 St., Miami, Fla. 33166.

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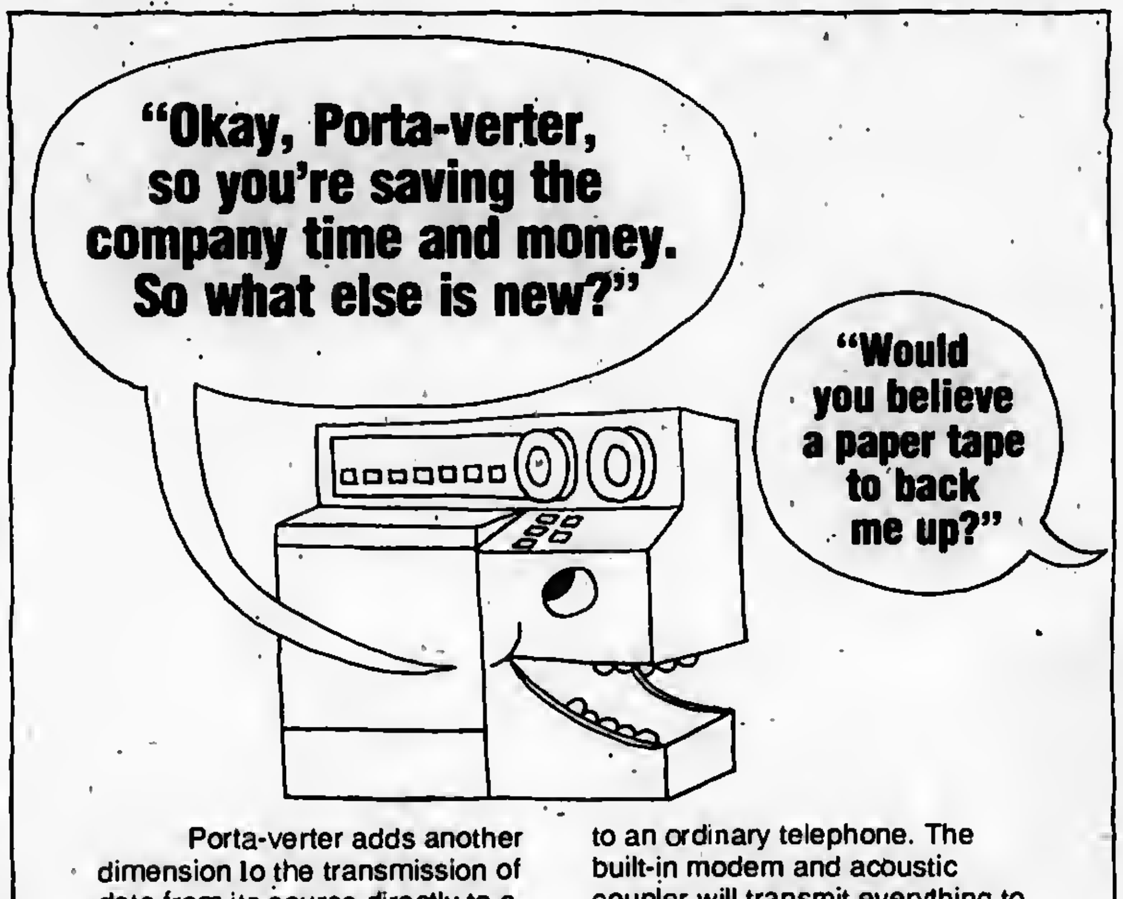
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On-Line System Helps Hospital Cope With Growth

WATERLOO, Iowa – A Midwest hospital has inaugurated an on-line system to cope with its rapid increase in outpatient service needs.

Schoitz Memorial Hospital, a 325-bed community facility here, has enormously increased its outpatient services in the last three years.

In the 1972-1973 fiscal year outpatient visits grew 10% over the prior year. But for fiscal 1974, it increased 29% and in fiscal 1975 it was up by 57%.

One reason for this growth in outpatient care is attributed to the discovery by insurance companies of economies in outpatient care as opposed to inpatient treatment, according to Raymond Burfeind, associate administrator at Schoitz.

"For many years the insurance firms felt that if their plans included outpatient care they would be swamped with bills for treating minor ailments," Burfeind said, adding most plans now have built-in safeguards against unnecessary visits.

Medical Information System

Schoitz recently implemented an on-line medical information system utilizing Univac Uniscope 100 CRT terminals to link various departments to its Univac 90/30 central system.

After substantial advance preparation and program conversion, the 90/30-based system was installed last February and began operation almost immediately without any parallel running of programs, Burfeind noted.

Nurse enters patient treatment data into terminal in radiation therapy department.

The system has a main memory of 131 bytes, integral card reader, punch and printer, and five Univac 8418 disk drives with a total storage capacity of 290M bytes. Three keypunch units and seven Uniscope 100 display terminals, of which three are equipped with attached printer units, complete the present system, he said.

Two of the terminals are located in the outpatient department. The others are individually sited in the laboratory, radiology department, radiation therapy, physical therapy and computer rooms.

The decision to acquire the 90/30 was made in 1975 when plans were formulated to deal with the rapid growth of outpatient services, Milt Hahn, DP manager, noted.

The Univac 9300 CPU in use then did not have the capability to service an on-line system. The hospital investigated computer systems manufactured by the major vendors to find the best one for its needs, Hahn said.

Use of the IMS/90, Univac's interactive transaction-oriented file management system, allows files to be accessed and modified on-line, Hahn said.

Displayed data can be limited to the specific information needed and the system eliminates the requirement for many lengthy paper reports. By using passwords, access to files under the IMS/90 also can be limited for security purposes, Hahn indicated.

"For years, we had been geared-up to handle inpatient information with reduced emphasis on outpatient services. Now with the rapid growth of outpatient work we had to put the full resources of DP to work to collect information in a timely fashion and to get a handle on outpatient costs," Hahn said.

"We justified the 90/30 acquisition to the hospital board on outpatient work alone," he noted.

Under the old method, the patient was given an envelope and a plastic nameplate containing personal and insurance information. The patient would then go to one or more departments where a prepunched card would be pulled.

After the charges were inserted the cards were added to the folder and the envelope was returned to the business office for review.

Finally, the cards were sent to the DP department for editing and entry into the system, Hahn explained.

"We found that this system was too unwieldy. The envelope or some of the cards could get misplaced or lost. Sometimes it took two or three days to get the information into the system, while the patient may have completed his hospital visit in under 20 minutes," Hahn said.

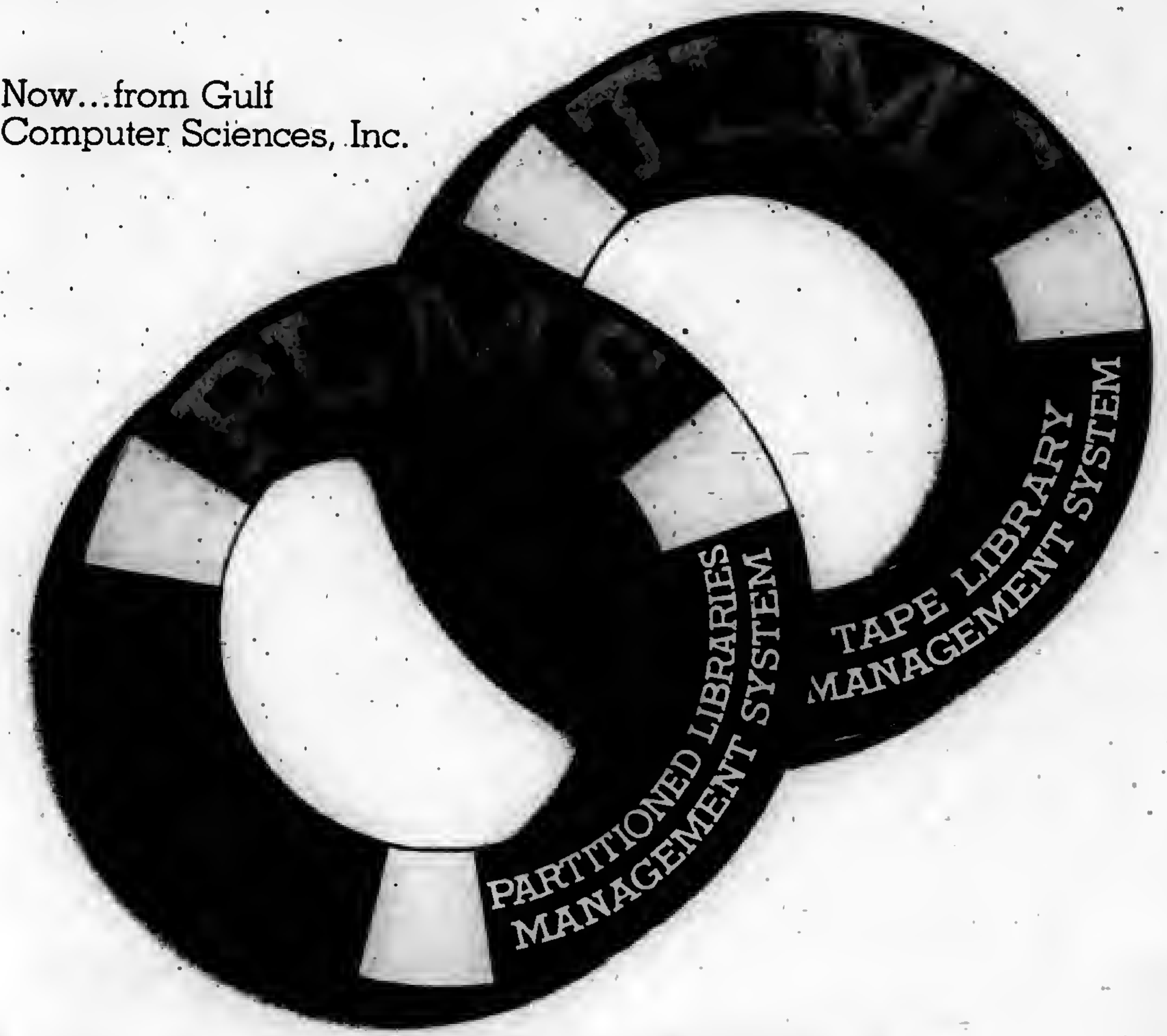
"Now when a physician calls the hospital to order outpatient treatment, the information is entered into the computer via a terminal at that time. When the patient actually arrives we can call up the information we need or the services requested within a few seconds on a terminal in the outpatient department," he explained.

Outpatient medical records can be accessed on-line either by name, Social Security number or a patient record number assigned by the hospital. The data bank contains information on a patient's previous visits coded to show services supplied and an identification number for each area employer providing insurance benefits.

Each service department the patient visits will input data on the services rendered and charges through a terminal. Eventually, when the system is fully implemented, authorized hospital personnel will be able to obtain an outpatient's complete record on the terminal screen and, if desired, receive a hard copy printout on the attached printer unit, Hahn indicated.

Roland B. Enos, Schoitz administrator, admitted the explosion of paperwork has left hospitals no choice but to computerize as extensively as possible.

"We couldn't possibly cope with the volume of reports required by increased government regulation and the insurance companies without the computer. It would be a horrendous job to try to do it manually," Enos said.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CTS Unit Prints 240 Point/In.

PARAMUS, N.J. – Computer Transceiver Systems, Inc. (CTS) has introduced the first in a line of terminals which are said to have 136-column printout and plotting capabilities for improved graphic presentation of data.

The Execuport 3000 has a printing resolution of 240 point/sq in. (24 vertical by 10 horizontal) made possible by the simultaneous movement of the print head and paper positioning, CTS said.

Built-In Coupler

Standard features include a built-in acoustic coupler compatible with Bell 103 series modems and a built-in RS-232 interface connector, according to the firm.

Other features include switchable mode options of half- or full-duplex, local or isolated operation, error control through selectable parity generation and a choice of teletypewriter-like or multimode keyboards with numeric clusters, the firm added.

The terminal prints at 10-, 15- and 30 char./sec and accepts 80- or 136-column paper, according to a CIS spokesman.

Optionally available are an out-of-paper alarm and 20-character response generator, he added.

The Model 3000 is compatible with paper tape and magnetic tape memory units, most peripheral equipment and major minicomputers, Computer Transceiver claimed.

A standard Execuport Series 3000 costs $3,495 or $158/mo on a one-year lease and $120/mo on a three-year lease.

The lease prices include maintenance, the spokesman noted from E. 66 Midland Ave., Paramus, N.J. 07652.

HP 2640B Offers Enhancements On Micro-Controlled 'A' Version

PALO ALTO, Calif. – The Hewlett-Packard Co. (HP) 2640B is a microprocessor-controlled CRT terminal that is said to have enhanced communications, additional firmware support for peripherals and other features including a 13% lower cost than the HP 2640A.

Hewlett-Packard 2640B

The B version offers a choice of either main-channel protocol or standard reverse-channel protocol. for half-duplex modem operation, according to HP.

Additional firmware enhancements are said to allow connection of most serial printers via an RS-232C interface and allow malfunctions of interfaced printers to be detected by a remote computer.

Keyboard layout has been improved and both absolute and relative cursor sensing and positioning have been incorporated, HP said.

Like the 2640A, the 2640B was designed to be used in both page mode and character mode operation for data entry and time-sharing applications.

Among its features are a semiconductor memory which can store over 400 lines of data that can be viewed 24 lines at a time by scrolling, an off-line data preparation and editing capability and expandability, the company said.

Built-in self-test and modular construction reportedly speed fault location and replacement of faulty components.

The terminal supports up to four separate character sets including optional line-drawing and mathematic symbol sets, HP noted.

Two additional display terminals based on the 2640B for Danish/Norwegian and Swedish/Finnish languages – the 2640N and 2640S – are also available.

The 2640B is priced at $2,600 and the 2640N and 2640S cost $2,750 each, HP said from 1501 Page Mill Road, Palo Alto, Calif. 94304.

Terminal Transactions

UDS Motor Controller Used With Teletypes

PHOENIX – United Data Services Company, Inc. (UDS) has introduced a buffered idle line motor controller for use with model 33 and 35 Teletype terminals.

The computer-compatible Teletype motor controller combines the wear-saving advantage of idle line motor control with a data buffering system which prevents any loss of data during the time it takes the motor to reach operating speed, UDS claimed.

To eliminate unnecessary mechanical wear on the machine, the controller automatically disconnects power from the teleprinter motor if no data is being exchanged either on the transmitted or received signal line, UDS said.

On sensing the presence of data on either the send or receive signal lines, the controller restores power; at the same time, a buffer memory in the controller delays the data received by the teleprinter to allow the motor to reach operating speed, according to the company.

After start-up, the buffer is automatically bypassed at the first pause in transmission, UDS explained.

The motor controller does not interfere with external connections to the Teletype and can be used for full-duplex as well as half-duplex or simplex communications, UDS said.

The controller is priced at $129.50 for the 312 A 0545 (for the Model 33) and $137.50 for the 312 A 0546 (for Model 35).

The units are available from stock, UDS said from 3024 N. 33rd Dr., Phoenix, Ariz. 85017.

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By Cecil Wright, Assistant Director
of Operations and Academic Services,
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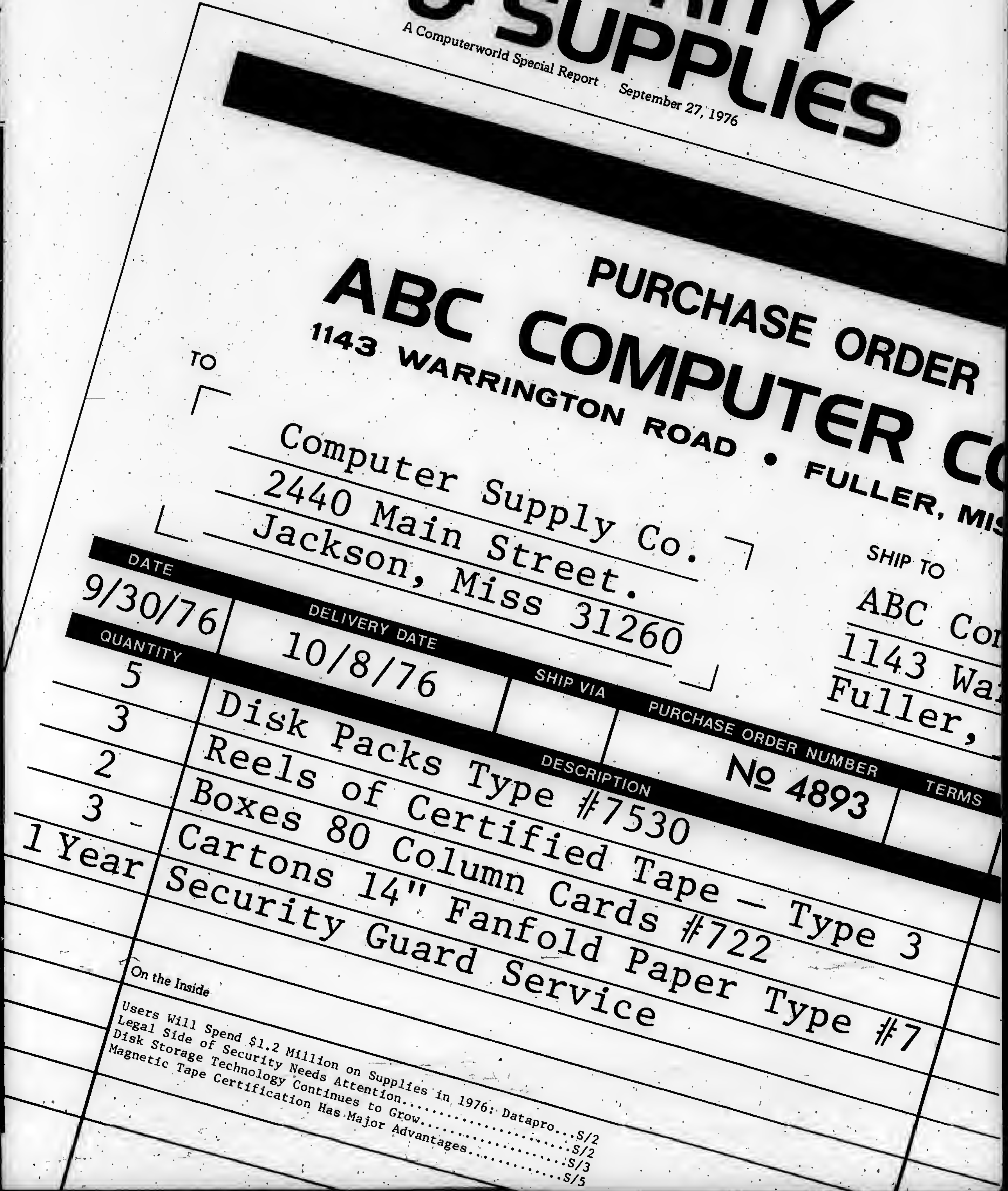
SECURITY & SUPPLIES

A Computerworld Special Report September 27, 1976



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2	Boxes 80 Column Cards #722
3	Cartons 14" Fanfold Paper Type #7
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On the Inside

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Legal Side of Security Needs Attention....................S/2
Disk Storage Technology Continues to Grow.................S/3
Magnetic Tape Certification Has Major Advantages..........S/5

Users Will Spend $1.2 Million On Supplies in 1976: Datapro

DELRAN, N.J. — Users will spend $1.2 million on DP supplies this year — 4.1% of their total DP expenditures, according to the results of a recent survey made by Datapro Research Corp.

Among users' purchases will be about 634 reels of tape per installation, Datapro said in a report covering a range of products including disk packs, diskettes, magnetic tape, punched cards and computer forms.

In preparing the report, the market research firm sent out requests for product information to approximately 200 vendors; user ratings were compiled from responses to a survey mailed to subscribers.

About 74% of these 461 responding to questions on 1/2-in. magnetic tape said they use 9-track, 1,600 bit/in. magnetic tape. The older 7- and 9-track, 800 bit/in. formats are used by 11% and 15% respectively, Datapro said.

As shown in Figure 1, not only do more of the users use 3M Co. tapes, but that company also got the most excellent and good ratings of the 10 vendors listed individually.

Philips-Style Dominates

The magnetic tape cassette market is dominated by the Philips-style cassette, which was introduced several years ago for audio recording and has "come into its own as a convenient recording medium for digital data," the report said.

Some vendors use the same type of cassette but a different recording format to provide additional capacity or other benefits.

Other small packaged tapes were termed "cartridges" because the terms "cassette" and "Philips cassette" are considered almost synonymous, Datapro noted.

Thirty-nine users, of which 13 used cartridges, reported their experience with these two media. No one vendor dominates this market, according to Datapro.

Removable disk packs, introduced by IBM in the early 1960s, have grown to dominate the direct-access storage field and have also put a crimp into the expansion of magnetic tape usage, according to the report.

The larger, multidisk units carry the label of "packs." These include the IBM 1316 (for 2311 drives), 2316 (for 2314 drives) and 3336 (for 3330 drives) disk packs.

The single-disk units, called "cartridges," include the IBM 5440 (for the IBM 3) and 2315 (for the 1130 and 1800 systems).

Similar Drives Offered

Other mainframe vendors offer similar drives which are generally capable of using the same types of disk packs or cartridges, although their data recording formats frequently differ from those of IBM, Datapro noted.

The diskette, or floating disk, is another type of removable rotating media that is intended as a low-cost, low-capacity direct-access facility, the report explained.

"The problems of mechanical structure are bypassed by using a flexible substrate and contact heads," it said.

Another disk type, the IBM 3348 data module, incorporates the recording heads into the removable disk package itself, "supposedly minimizing the problems of reading and writing with different 'assemblies,'" according to the report.

In May and June of 1975, a total of five vendors announced 3348-compatible data modules.

'Remarkably High Level'

There were 417 user responses to the survey and, as shown by Figure 2, the disk pack vendors received "a remarkably high level of overall user satisfaction with their products," the report said.

The survey form requested that users report the number of packs they acquire annually. A total of 392 installations said they use, on the average, about 18 packs per year, which is five less than last year's average, Datapro noted.

Approximately 300 users responded to the survey questions concerning forms and ribbons. Ribbon purchases averaged over 220 per year, with IBM getting the lion's share of the users.

Punched Cards

Punched cards were also evaluated by the survey and, based on the responses of 321 users, an average of about 3.1 million cards were purchased last year by each one.

"This figure is down considerably from the average figure of five million cards reported in our 1975 survey," the report said.

"The primary reason for the apparent decline is the increasing popularity of other forms of data entry," Datapro explained.

Vendor	No. of User Responses				Ratings				
	Total	By Format							
		7-tk	9-tk, 800 bpi	9-tk, 1600 bpi	WA	E	G	F	P
BASF	48	5	6	37	3.4	20	26	2	0
Burroughs	17	1	5	11	3.6	11	5	1	0
Control Data	3	1	0	2	3.7	2	1	0	0
Graham	69	6	10	53	3.6	45	23	1	0
IBM	42	2	3	37	3.5	21	21	0	0
Memorex	78	7	15	56	3.3	32	42	4	0
Nashua	5	0	0	5	3.4	3	1	1	0
Pryor	3	2	0	1	3.3	2	1	0	0
3M	118	12	15	91	3.4	62	50	3	3
Wabash	36	7	7	22	3.1	11	21	2	2
Other vendors	42	7	10	25	3.3	16	21	5	0
Totals	461	50	71	340	3.4	225	212	19	5

All Charts Copyright Datapro Research Corp.

Figure 1. User Ratings of 1/2-Inch Magnetic Tape

For this chart and those below, E=Excellent, G=Good, F=Fair, P=Poor and WA=Weighted Average on a scale of 4.0 for Excellent.

Vendor	No. of User Responses						Ratings				
		By style									
	Total	2316-1	2316-2	3336	5440	Other	WA	E	G	F	P
BASF	29	6	9	9	2	3	3.6	17	12	0	0
Burroughs	18	2	6	0	0	10	3.3	8	7	3	0
BST	3	0	0	0	3	0	4.0	3	0	0	0
Caelus	21	6	1	9	1	4	3.5	10	11	0	0
Control Data	42	10	5	15	1	11	3.6	27	14	1	0
CFI	17	2	2	5	4	3	3.6	10	5	2	0
DEC	3	1	0	0	0	2	3.3	1	2	0	0
Honeywell	5	1	0	0	0	4	3.6	3	2	0	0
IBM	56	8	2	31	8	7	3.7	37	19	0	0
Memorex	79	21	7	37	2	12	3.5	44	35	0	0
Nashua	41	7	1	28	1	4	3.4	21	16	4	0
3M	64	13	10	27	7	7	3.7	46	18	0	0
Univac	7	0	0	1	0	6	3.1	2	4	1	0
Other Vendors	32	10	2	5	7	8	3.4	14	17	1	0
Totals	417	87	45	168	36	81	3.6	243	162	12	0

Figure 2. User Ratings of Disk Packs

Vendor	No. of User Responses	Ratings				
		WA	E	G	F	P
BASF	6	3.3	2	4	0	0
Burroughs	3	3.3	1	2	0	0
IBM	30	3.5	15	15	0	0
Memorex	5	3.2	1	4	0	0
Syncom	6	3.7	4	2	0	0
Tab Products	3	3.3	1	2	0	0
3M	4	3.8	3	1	0	0
Other Vendors	15	3.6	10	7	0	0
Totals	71	3.5	37	36	0	0

Figure 3. User Ratings of Diskettes

Vendor	No. of User Responses	Ratings				
		WA	E	G	F	P
80-Column Cards—						
A.A.I.	4	3.8	3	1	0	0
Advanced Computer Supplies	5	3.2	1	4	0	0
BSC	3	3.3	1	2	0	0
Control Data	5	3.0	2	2	0	1
Data Documents	65	3.4	28	36	1	0
Globe	30	3.2	11	15	3	1
Hackett	15	3.2	4	10	1	0
IBM	88	3.6	52	34	2	0
Jersey Tab Card	18	3.5	9	9	0	0
Kelly	4	3.5	2	2	0	0
Lewis Business Forms	6	3.2	1	5	0	0
Morley	3	3.0	1	1	1	0
National Electronic Card	11	3.5	5	6	0	0
OEI	14	3.3	6	5	2	0
PDC	6	3.3	2	4	0	0
Pryor	18	3.7	12	6	0	0
Other Vendors	58	3.5	29	28	1	0
Totals	353	3.4	169	169	11	2
96-Column Cards—						
Burroughs	3	3.3	1	2	0	0
Globe	5	3.6	3	2	0	0
Other Vendors	13	3.5	7	6	0	0
Totals	21	3.5	11	10	0	0

Figure 4. User Ratings of Punched Cards

Many Facets Involved

Legal Side of Security Needs Attention

By Roy N. Freed
Special to Computerworld

Much attention is being given to the physical side of computer security — sprinkler systems, door locks, identification means, file dumps and the like. It is important and its need is obvious.

But comparable attention must be given to the legal side of security.

The legal side of security has a number of facets. It prescribes the nature and scope of the obligations of the parties to transactions, whether suppliers or users, to take security precautions of various sorts, physical and otherwise.

It also prescribes the liabilities of those parties to each other and to third persons in the event of breaches of those obligations. This particular aspect includes not only opportunities to limit or exclude liability, but also to secure indemnification commitments.

In effect, the allocation of liabilities, however accomplished, defines how the parties to computer transactions will divide between them the actual dollar impacts of the inevitable risks of loss.

The legal aspects of security must be recognized for the inherent exposures to harm and monetary loss that can exist, for the opportunities available to mitigate them or shift their impacts by conscious agreement between the parties and for the methods for working out those agreements.

Persons who manage computer transactions for either suppliers or users should achieve enough awareness of this subject, at least to identify exposures to loss and opportunities, in order to know when to call in professional legal help.

In any event, they should be able to recognize, from time to time, how much they do not know and should be wary of ever trying to handle the entire subject alone. The pitfalls and risks are too great to take that chance.

Meaning of 'Security'

"Security," or "computer security," has a much broader meaning than has been acknowledged thus far. It really means freedom from practically all types of harm resulting from or related to the use of a computer.

That harm might be suffered directly by a computer user. Its impact might be felt by a supplier to a user. Its impact also might fall on a third person to a transaction, such as a passenger on a computer-controlled vehicle or a patient on whom a computerized intensive care unit is used.

The harm might be experienced with respect to physical things, like hardware or bodily injury, or to intangible things, like a tarnished reputation, loss of profits, business interruption or a duty to pay money.

It is impractical to take a more limited view of security in a legal context because the same legal approach for each aspect applies to all the others.

There can be a number of legal duties, or responsibilities, that require taking precautions, with different sources and different degrees of compulsion to perform them. Some exist automatically when the parties fail to act — nonaction can itself represent the making of a decision respecting the applicability of security obligations.

However, by skillful handling, the parties can mold those duties to their particular needs. There are many opportunities to do so. Their enjoyment requires not only a knowledge of how to handle the legal duties, but also the ability to identify wisely the need for them in individual situations.

(Continued on Page S/4)

Disk Storage Technology Continues to Grow

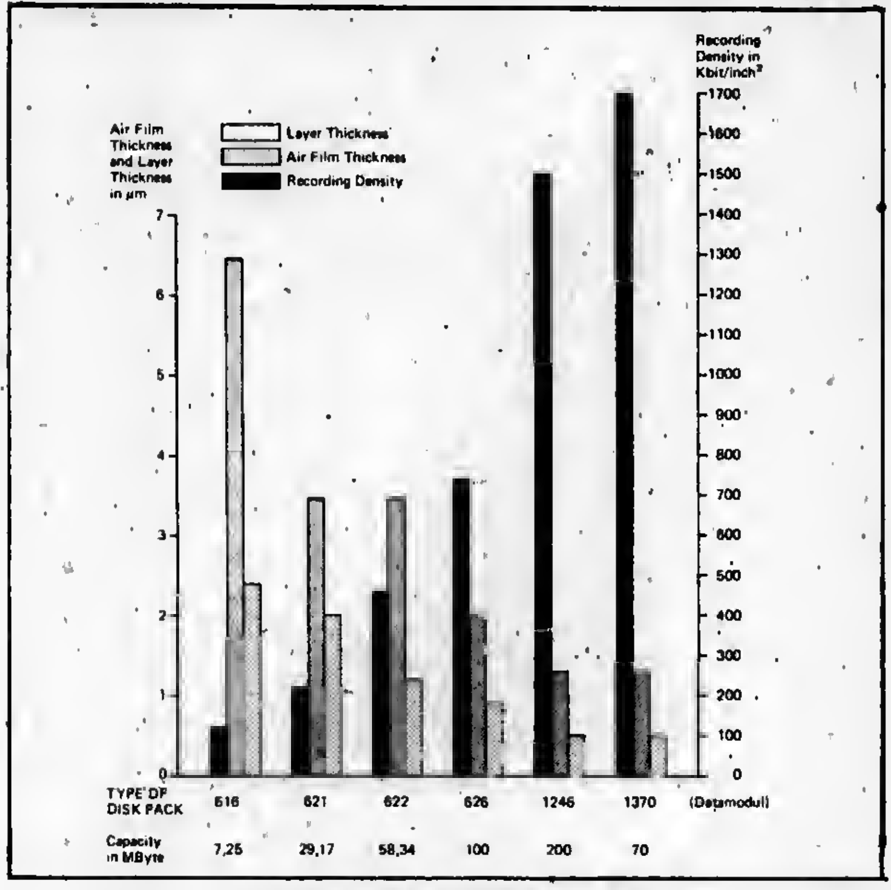
By Guenter Mallmann
Special to Computerworld

As a rule, the DP user is only interested in the fact his computer runs smoothly. A dissertation on how it works and on what technological master strokes it is based understandably leaves him cold.

But the development and line production of the latest generation of disk packs — the 200M-byte packs and data modules — have again extended the already breathtaking technology of computer scientists and engineers. They seem close to the absolute limit of physical possibility.

Does this mean disk technology reached the end of its road? Does it have any prospects of remaining DP's economical and "fast" storage medium over a prolonged period?

Remember when interchangeable disk storage first appeared, less than 15 years ago? Coating thicknesses were in the order of a few thousandths of a millimeter. The first line produced magnetic disks of the kind we know today.



Increase of Recording Density
Depending on Layer and Air Film Thickness

For example, the magnetic disks for the IBM 1311 disk drive introduced in 1962 had the then-improbable coating thickness of 6 micrometers. The recording density was 1,020 bit/in., the track density up to 50 track/in. and the required rotational speed was 1,500 rpm.

The air cushion on which the read/write head flew over the disk surface was 4 micrometers thick. In order to achieve this "flight altitude," which could not be exceeded without loss of signal, the surface smoothness had to be within limits which, until then, had hardly seemed imaginable. With a clearance of 4 micrometers, a ridge the size of a smoke particle would have caused direct contact with the head; conversely, a scratch the same size would have caused a signal failure.

Besides the surface under the read/write head, the entire disk had to be free of irregularities. During rotation, any irregularity on the surface causes axial disk deflection (axial run-out). This forces perpendicular movement toward the read/write head and can lead to wobbling or even head crash.

Years of laboratory research preceded these first-generation disk packs, but at first it was applied only to drum storage. The idea of not leaving the read/write heads in physical contact with the surface, but making them glide on an air cushion, was developed for drums in 1954.

A few years later, the experiments were extended to disk storage. IBM did pioneer work here as it made further developments of disk storage technology.

Next Technology Stop

The specifications which characterized first-generation magnetic disks and associated storage devices still defy the imagination of laymen, yet the next stop in the history of disk storage technology progressed far beyond these parameters.

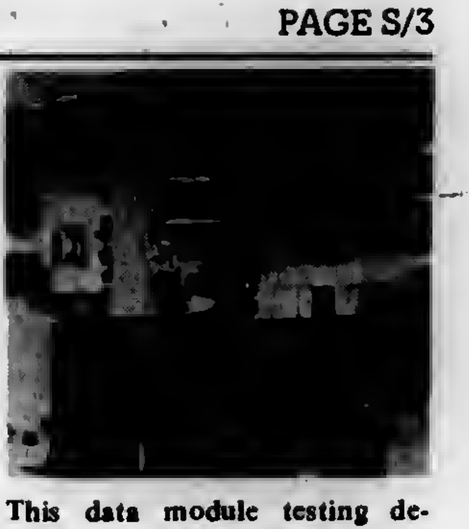
Coating thickness was an average 3 micrometers and clearance was 2.5 micrometers. Track density was improved to 100 track/in., recording density to 2,200 bit/in. and the rotational speed was raised to 2,400 rpm.

As far as disk technology was concerned, this advance was astonishing enough, but it was only a sign that manufacturing methods had been mastered. On the equipment side, the step taken was perhaps even greater.

The increased track density made highly sensitive position-detection devices necessary and, at the same time, the advantage of the higher transfer rate necessitated reducing access times.

Ultrathin Coated Disks

Development did not stop there. Next came ultrathin coated disks with a recording density of 4,040 bit/in. and a rotational speed of 3,600 rpm: the 100M-byte pack.



This data module testing device records endurance of head towers with the objective of testing material wear.

Coating thickness and head clearance were reduced again. Average coating thickness became 2 micrometers — one-thirtieth the thickness of a human hair — and "roughness value" became .04 micrometers, which meant all peaks which extended above a mean height had to be mechanically removed.

The technical possibilities for positioning the read/write heads had been exhausted with the previous generation, so new ground had to be broken. The pack itself was made directly responsible for positioning.

Until then, technical devices, such as the track position transducer, had controlled head positioning. These were delicate components which required a lot of servicing and could cause problems of compatibility with different drives.

It must be remembered that, with these ultrathin coated disk packs, heads had to be positioned on tracks only 100 micrometers apart. Even slight temperature differences between different drives

(Continued on Page S/6)

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Complex Legal Side of DP Security Needs Attention

(Continued from Page S/2)

Statement of legal duties to observe good security practices can be found in various places. These include, primarily, the common law rulings of courts in specific cases, statutes enacted by legislatures and provisions in written or oral contracts entered oral contracts entered into between parties to transactions.

Statements of legal duties relating to security can be encountered in a wide variety of circumstances and under many guises.

For example, courts say banks and physicians have implied contractual obligations not to disclose to third persons information received from their customers or patients, regardless of the types of systems used to keep their records.

The "implied contract" fiction is simply a contrived basis for a "thou shalt not" legal rule enforceable with penalties of some sort. The reference to the legal concept or symbol "contract" can give important messages respecting the applicable yardstick for measuring damages and how long an injured party may wait before suing.

Because of the circumstances under which the specific reported cases arose in those two areas, it is not clear yet whether the duty is absolute (so damages must be paid if any unauthorized disclosure occurs) or whether it merely requires reasonable measures to avoid unauthorized disclosure (with no penalty if disclosure occurred).

Courts also say that corporate directors have a duty to guide their corporations with the same care they would use in their personal business affairs in order to spare those corporations' avoidable losses of various sorts.

Courts also hold that manufacturers and suppliers of products, which would include computer systems, are liable for harm resulting from their use.

Avoiding the Courts

In light of the potential sources of legal obligations respecting security and the related financial losses resulting from breach, persons with potential exposure should recognize the importance of treating the subject specifically in written agreements.

That approach can be far superior to abdication of the decision-making process to courts. The scope of court decisions are functions of the degree of sophistication with computer technology possessed by the judges and lawyers involved.

In some cases, the risk to the parties from resorting to that forum is unreasonably great. The parties should try their hands at defining their relationship voluntarily.

Of course, the obligations to provide security have genuine significance only in terms of the actual penalties suffered for their breach. What is the likelihood that some burden will fall on a violator and how large can it be? Will it be only in money or can actual compliance with obligations be compelled?

Unless a security breach constitutes a crime, a person harmed is ordinarily entitled only to dollar damages to cover monetary loss.

In some special cases, however, a party might be entitled to a judicial order compelling compliance with security precautions in order to avoid a breach from occurring or to minimize the impact of one that happened.

This means the person claiming harm and entitled only to money damages, if anything at all, must bring a lawsuit, establish a legal basis for his claim and prove the amount of legally allowable damages.

Except where the damages are substantial, this burden is enough to discourage all but the most hardy claimants. By the same token, it gives the person exposed to potential liability encouragement to gamble on the chance that it will suffer no significant penalties.

It is unlikely criminal penalties will be authorized to any substantial extent, but they do apply to some thefts of trade secrets, which covers many kinds of software programs.

Shifting the Impact

In light of these realities of legal remedies, it is essential to assess the actual net impact a security breach could have and to plan strategy accordingly. There are a number of tactics that can be taken to shift the impact of security breaches.

These must be tailored carefully in light of whether the person considering them is a user or supplier.

The financial impacts of security breaches can be shifted to others in various ways by a careful party that has some bargaining power and uses it skillfully. The means for that shifting primarily include securing outside insurance, securing indemnity commitments from the other party and fixing liability at some level, which could be zero.

It should be recognized that those means are not mutually exclusive. They may, and should, be used in combination, tailored in each case to the basic relationship negotiated by the parties.

Indemnification Approach

The most obvious measure for risk shifting is insurance. Both users and suppliers should consider it. A wide variety of coverages are available to users, including those for equipment losses, computer media losses and business interruption consequences.

The hope, and normal expectation, in buying insurance is that the insurer will be solvent when a claim has to be made. It is possible, in many situations, to get comparable commitments from the other party to a procurement-marketing agreement, but not always with confidence that the committing party will be able financially to honor them.

An indemnification commitment is only technically or superficially different from a regular contractual promise. Each party can be liable to the other by virtue of a wide variety of direct contractual promises; an indemnification obligation is just one form of such promise.

It probably relates particularly to a promise to reimburse a party for amounts it must pay to third persons for one of various reasons. That type of commitment is encountered most commonly as an obligation running from the supplier to the customer in connection with potential patent and similar infringement.

It also could be appropriate if a certain type of computer use exposes the supplier to lawsuits with little likelihood of legal validity.

There are many ways in which the parties can limit liability by express agreement.

Freed is an attorney with Powers & Hall in Boston and a regular contributor to Computerworld.

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In the Short and Long Run

Magnetic Tape Certification Has Major Advantages

By Miles D. Bender
Special to Computerworld

What is magnetic computer tape certification?

Webster defined "certify" as "to assure or make certain." Therefore, to certify magnetic computer tape to zero errors is to assure or make certain the reel of tape has zero errors.

This is generally done on a tape certifier and is accomplished by saturating the magnetic tape or writing on it with 100% of a signal and instantaneously reading it back to see whether a parity is achieved.

Normal industry standards call for reading back at least 50% of the signal at 800 bit/in., 35% of the signal at 1,600 bit/in. and 40% of the signal at 6,200 bit/in. All of the specifications give a reasonable margin of safety on any normal computer.

Most computers are set so they will read back a signal and receive parity as long as they can read between 12% and 20% of the original signal placed on the computer tape.

Proper Certification

Proper certification itself most closely parallels actual computer usage of magnetic tape.

During certification, a tape is retried several times before it is established that an error or bad spot exists which is unable to be read back. Certifiers generally retry three times.

This may be a temporary or nonpermanent error which can be normally corrected by a certifier operator. Computers may be set to retry as many as 50 to 100 times before an actual error or lack of parity is established.

Most certifiers have vacuum towers which most closely simulate a computer in establishing the tape-to-head contact pressure.

Several Combinations

Certification can be done using several combinations of read/write heads. Generally, the write head covers the entire surface of the tape and saturates the tape with the 100% signal.

Total surface certification is the use of 5/4 overlapping read heads which cover the entire surface of the 1/2-in. computer tape, including that area out to both edges of the tape.

This is called total surface certification and certifies the entire surface of the tape, leaving no areas of the tape uncertified, including the outer edges where deterioration and problems can originate.

Full-width or track or channel certification is the certifying of specific channels used for the recording on the tape — such as 7-track, 9-track or, in some cases, a combination head using both simultaneous certification of the 7- and 9-track tape.

This type of certification leaves much still uncertified. In the use of a simultaneous 7-and 9-track tape, certification still leaves approximately 18% of the tape uncertified, including the critical edges of the tape.

Certification is the examination of a tape in a manner most similar to its actual use on a computer.

While complete certification is falling out of favor with most manufacturers for various reasons, including the declining price of magnetic computer tape, Syncom, Inc. feels it is extremely important in both the short and long run to the computer user. Consequently, Syncom certifies to zero errors each reel of tape it sells.

With the advent of the new high-speed drives, including the super high-speed rewinds, and the advent of higher and higher packing densities, the necessity for a complete certification becomes critical.

Reduction of immediate problems and, particularly, long-range problems that result from high-speed drives and higher packing densities will make total certification more and more important.

The purchase of a fully certified tape, despite its slightly higher cost, will save countless dollars in problems, computer time, rerun time and, possibly, in the extremely costly recreation of important data.

Confusion of Words

Today in our industry, instead of full certification, we are finding a confusion of words which perplex the end user. Phrases such as "fully tested," "fully evaluated" and "totally tested" are the most common ones that have cropped up in our industry of late. However, none of them means "fully certified."

Certain manufacturers optically scan tape after it is coated, but before it is slit into 1/2-in. widths, looking for gross imperfections and missing oxide.

Some manufacturers batch test their computer tape, i.e., testing but not certifying 10% or some similar number. If the 10% sample looks pretty good, then the entire batch is considered to have passed the test.

When the war of words is over and the new, more sophisticated high-speed computers and higher packing densities have been on the scene for a reasonable period of time, total certification of magnetic computer tape is going to become a necessity.

Anything less is going to be extremely costly in the long run and might jeopardize the security of the valuable data which has been entrusted to the magnetic computer tape.

Bender is president and chairman of the board of Syncom, Inc. in Orchard Park, N.Y.

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Disk Technology Hasn't Reached the End of Its Road

(Continued from Page S/3)

and disk packs, combined with the increased data, could mean a pack written on one drive could not be read on another.

A further difficulty with this positioning device was head alignment: for trouble-free processing, all heads in the bead tower had to be located absolutely vertically above one another.

In 100M-byte disk packs, it was possible to eliminate at least some of these problems by transferring positioning to a servo surface in the center of the pack.

The step to 100M-byte capacity was also made possible by changing the recording process of the 100M-byte drives.

So far, from 29.17M-byte packs up to 100M-byte packs, development followed a relatively straight line — technological evolution rather than revolution. And now this technology reached its limit.

Further capacity increases would require new methods. When double-density packs (200M-byte capacity) and data modules (also called Winchester packs) came on the market, not much was said about technology. For the user, transition to the new packs which doubled or more than doubled capacity was perhaps less sensational than previous developments.

That was true at least for the standard disk pack, but somewhat less true for the data module, which was distinguished by a new design with both disks and read/write heads sealed in the module.

Behind unpretentious types of designations, however, such as IBM 3348 or BASF 1370 (both data modules) and IBM 3336-11 and BASF 1246 (both 200M-byte packs), was a bundle of technological innovations, especially with regard to the coating.

Development has concentrated on increasing capacity because the daily quantity of information received grows in two respects: first, through the purely numerical increase in certain units (more customers, more stock items, more accounts, etc.); and second, through the transfer of more and more business processes to the computer, i.e., in banking, in supermarkets and in medicine.

If storage capacities had not grown at the same time, there would be whole warehouses full of disk packs and armies of operators would be lost in row upon row of disk drives. This is quite apart from the fact that faster, more powerful computers can only be economically utilized if they have higher on-line capacities.

So the demands on technicians and scientists were clear: they had to design disk systems which could record and supply even more data, even more reliably, even more quickly.

The starting point for this new generation of disks was equally clear. Increased capacity could only be achieved by a decisive improvement in the disk manufacturing process and it had to cover every single stage of production.

More precisely, ways had to be found to build up a magnetic coating to a thickness between 1- and 1,5 micrometers and with a roughness so minimal that the read/write heads would be able to maintain stable flight at the height of .5 micrometers.

A coating thickness of 1- to 1.5 micrometers requires a substrate which itself has a roughness value already more stringent than that of the coated surface of the previous generation of disks.

This means there must be no peaks or pinholes on the surface of the aluminum disk deviating from an imaginary ideal line by more than .02 micrometer. In previous generation disks, this value was twice as high.

Naturally, the machines which had been perfected over years of development for machining the aluminum plate which serves as a substrate no longer satisfied these performance criteria. So the whole technology of substrate machining had to be changed, starting from the automatic lathes right through to the grinding and polishing machines.

But coating dispersion — the mixture of iron oxide particles, solvents and lacquers — also had to be developed to new formulas using new starting materials. With the size of an oxide particle about 1 micrometer, a coating thickness of 1 micrometer of the spaces between the particles posed a danger of being too large and leading to loss of impulse.

At the same time, requirements for greater abrasion resistance and adhesion had to be met. Friction also had to be reduced between the head and the disk when they came in contact with each other.

The coating itself, 1 micrometer thick at the inner radius and 1.5 micrometers thick at the outer radius, is the real stumbling block in the whole process. The dispersion has to be applied to this thickness in one operation and the magnetic particles must be oriented at the same time.

The subsequent machining of the coated and oven-hardened disk is another delicate process. Here, as with the substrate, the last irregularities in the .1 micrometer range must be ground off. The surface roughness average is .02 micrometer, which sets the standard for the process.

The subsequent steps of disk pack assembly are not new, but are more costly because of the increased expense of inspections and intermediate measurements with a whole series of specially developed measuring instruments.

The high storage densities of these disks are primarily the result of new disk technology — new in almost all stages of the production process. On the equipment side, there has been less further development of traditional disk drives with compatible disks.

With the ultrathin coated disk, the disk coating has reached its limit in the present state of knowledge.

In television engineering, however, disks coated with metal alloys have been used for years for slow-motion shots, such as the instant replays for sports events. The coatings on these disks are .1 micrometer thick, in comparison with 1 micrometer of the ultrathin coated disks.

In laboratory tests, recording densities between 12,000- and 20,000 bit/in. have been achieved. The technical production of such disks with various coatings (magnetic alloys) is possible in various ways — by an electrochemical process, by sputtering, by decomposition of volatile metallic compounds and so forth.

On the equipment side, a further improvement of the read/write heads, which would also permit significant increase in recording density, is conceivable.

In any case, the disk still seems to have a good future as a cost-effective mass storage device. Disk technology has not reached the end of its road.

Mallmann has been with BASF in West Germany since 1972.

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Or, a DBMS system might be an appropriate solution to the problem, but there's lack of commitment to its installation. DP managers may not be cooperative, and users may refuse to go along. Failure is the result, but it's not the system's fault.

We won't be dwelling entirely on failures, of course. We'll spend a lot of time looking at successful DBMS applications, with stories from users, analyses of systems in use and case studies. All-in-all, it should help you manage your data base better. And it could help you avoid a costly mistake.

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Bits & Pieces

Off-Line Plotting System Prepackaged by Gerber

HARTFORD, Conn. – The Model 6242 Data Superplotter system is a prepackaged off-line plotting system from Gerber Scientific Instrument Co.

Using the Model 42 Superplotter and the 6200 plotting system control, the system features stationary motors and minimum inertia; plotting speed is 42 in./sec, Gerber said.

The Series 6200 uses microprocessor technology. Input is standard 1/2-in. magnetic tape with either 800- or 1,600 bit/in. densities.

Programs for the 6200 reside in read-only memory modules so there is no need for program loading, Gerber said.

The system costs $52,300 from the company at P.O. Box 305, Hartford, Conn. 06101.

AKS Has Training Package

NEW YORK – "New Equipment Training" from Advanced Keyboarding Systems (AKS) is said to be a comprehensive training program for conversion from old to new data entry equipment.

The program takes into consideration productivity and schedule maintenance, AKS said, and features customized functions which address the particular aspects of the data entry equipment involved.

Supervisor and operator training are also included.

The package costs about $150 per operator for a minimum of 10 operators. Prices fluctuate according to the installation, the company noted from 437 Madison Ave., New York, N.Y. 10022.

Formatter IEEE-Compatible

SAN DIEGO – A buffered magnetic tape formatter said to be compatible with the Institute of Electrical and Electronic Engineers (IEEE) standard bus is available from Dylon Corp.

The Model 1051A allows the user to add an industry-standard magnetic tape drive to the general-purpose interface bus and provides asynchronous data transfer to and from recorders made by Cipher, Pertec, Wangco and Kennedy, the vendor said.

The unit, featuring read-after-write error checking with automatic correction, is controlled by a dedicated microprocessor.

The Model 1015A is available in 7-track, 9-track and 9-track phase-encoded models and can be rack-mounted. The 7- and 9-track models cost $2,895 while the phase-encoded model costs $3,895.

The unit will be available in November, Dylon said from 7854 Ronson Road, San Diego, Calif. 92111.

Supports IBM Native Mode

Memorex Subsystem 3350-Compatible

By Esther Surden
Of the CW Staff

SANTA CLARA, Calif. – The 3650 direct access disk storage subsystem from Memorex Corp. is a device that is plug-to-plug compatible with the IBM 3350 and offers software support not available from IBM, according to a Memorex spokesman.

Designed for IBM 370/135 through 370/168 systems, the disk subsystem uses Winchester-type technology; the media, read/write heads and circuitry are all located in a removable unit, the firm said.

In addition to standard IBM software support, Memorex optionally supports the 3650 under DOS/VS in all modes of operation and offers OS/370 Native Mode support, a capability only recently announced by IBM, a spokeswoman said.

The subsystem consists of four models: the 3650 direct access storage model; 3653 storage module and controller; 3654 storage module and alternate controller; and the 3674 control unit.

The 3650 dual-spindle storage module can contain 635M- or 317.5M-byte/spindle with a transfer rate of 1.198M byte/sec, Memorex said. An optional fixed head allows zero seek time for 1.14M bytes of the 317.5M byte/spindle.

A typical subsystem includes a 3653 storage module and controller and three 3650 storage modules. Users may substitute the 3654 storage module and alternate controller for one of the 3650s to provide duplicate control electronics for string protection, Memorex noted.

With the 3674 storage control unit, users can attach one to four 3653 modules and controllers and up to 12 3650 modules, allowing one 3674 to control up to four strings of drives with eight drive/string, the company added.

Memorex 3650

The Memorex 3653 can be directly attached to the IBM 370 CPU through either the 3674 storage control unit or the IBM 3820-2 storage control unit.

Memorex and IBM drives can be intermixed when attached to the IBM controller on a string-by-string basis, but IBM drives are not supported on the Memorex controller, the spokesman added.

At the time of installation, users can select either Native Mode, Memorex 3670 compatibility mode or Memorex 3675 compatibility mode under OS/VS; under DOS/VS, only the 3670 compatibility mode is available.

Native Mode provides a capacity of 317.5M byte/spindle; 3670 compatibility mode provides 100M byte/spindle; and the 3675 mode provides 200M byte/spindle, Memorex said.

The subsystem will be available in the second quarter of 1977. Memorex has not yet released prices for the 3650, a spokesman said, but they will be "competitive."

Memorex is at San Thomas at Central Expressway, Santa Clara, Calif. 95052.

Third-Party Maintenance Eases Mixed-Vendor Site Operations

MANCHESTER, Mo. – The Archdiocese of St. Louis has had one less cross to bear since it took advantage of third-party maintenance of its mixed-vendor system, its DP director indicated.

The archdiocese decided to buy independent peripherals for its IBM 360/30 because it found it could get products equivalent to those of IBM's, "if not better, for the same amount of money," Kenneth C. Halveland said.

When the mixed system was first implemented, each piece of equipment – the 360/30 CPU, 1401 N1 printer and 2501 card reader from IBM, disk drives from Control Data Corp. and tape drives from Telex Corp. – was maintained and repaired as necessary by its own manufacturer.

This arrangement required scheduling the three different service representatives every few weeks, Halveland recalled.

The DP department, located in this St. Louis suburb, also experienced some costly delays in getting the equipment serviced. "We were considered a very small customers to three separate vendors," Halveland said, so the archdiocese decided to go to third-party maintenance.

Two maintenance companies were considered by the department – Raytheon Service Company (RSC) and Sorbus. "Six months before we chose Raytheon, we considered Sorbus, but it wouldn't take all of our peripherals. It would accept everything but the Telex tape drives, and we didn't feel there was any real advantage in switching from three service companies to two," Halveland said.

RSC, on the other hand, agreed to service the entire system, and the scheduling problem has been eliminated.

"A main concern of changing to third-party maintenance was the availability of parts from all manufacturers. We have found this to be of minimum concern, because RSC stocks more parts and has been able to obtain faster service from manufacturers than the archdiocese could," Halveland added.

(Continued on Page 35)

Negotiations – Part 1

Interdisciplinary Team Necessary

By Joe Auer
Special to Computerworld

This article, the first of three in a series about optimizing computer negotiations, deals with the formation of a negotiation team.

The first step in optimizing computer negotiations is to form an interdisciplinary negotiating team. Members should consist of top DP management personnel, legal counsel with some degree of computer law expertise, a financial analyst with as much computer finance experience as you can find and – very importantly – a member or two from top management of your company.

The negotiating team's leader should be in a position in the company to effectively direct a major business undertaking. His general responsibilities are to develop and direct the negotiating strategies, assign and monitor specific tasks that are to be accomplished through the scheduling of other team members and direct the actual implementation of the negotiating strategies.

In developing the strategies for negotiations, the first thing the team leader does is to break the requirements down to task-oriented procedures and assign the tasks to individual team members and the team as a whole on a timeframe basis.

(Continued on Page 34)

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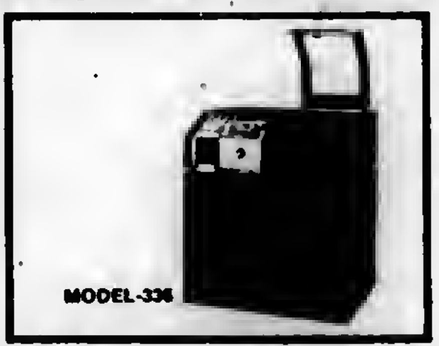

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Interdisciplinary Team, Data Collection Needed in Negotiating With Vendors

(Continued from Page 33)

An unplanned situation could result in sitting around a big table for 12 to 14 hours a day, with their individual participation only amounting to maybe one or two hours.

Outplanning the Other Side

Keep in mind that major negotiations are not only a mental but a physical task. If the cast of characters from both sides are assembled and are resolved to continue the meeting until negotiations are completed, you might be there for a week or two. In this case, the idea is to outplan the other side.

With planning, you can have an emotional advantage by requiring the vendor's people to be at the negotiations the entire time and have your members only strategically present when they are needed.

The next major step is to determine the requirements or define the problem or set of problems you want to resolve in your negotiations. You must go through a data collection process, set meaningful objectives, prioritize these objectives, parameterize them and then arrange an agreement between the negotiating team members that the objectives are what you wish to accomplish. You must then get appropriate levels of approval from the top management of your company so you have authority with which to negotiate.

Data collection is important because most computer negotiations are won or lost on the basis of the information the negotiating team has and the effectiveness with which it is used.

The first thing that should be done is a survey of members of the DP department, top management in your company and the ultimate end users of the DP department.

Too many times a contract decision maker, lawyer or financial type negotiating a computer contract without this survey leaves some considerations out of the contract because he has a predetermined set of ideas about the best method of acquiring a computer for the company.

Once you have a handle on your requirements, expand your survey to other computer users of your chosen vendor.

Look through your own vendor contract files if you have had any history at all in negotiating to determine how well you have done in the past.

Try to form some "extrapolated concession rationale" for the new equipment you are considering. That is to say, if X concession was given to you in the past for Y amount of computer value, then extrapolate X into the size of computer that you are currently considering.

You should make a very serious effort to collect substantiative data. For example, collect all of your past, currently in effect and currently considered contracts. Review your files for all side letters documenting "noncontractual commitments," statements on vendor policies, and areas of agreement and disagreement you have had in the past with computer vendors.

Another helpful thing is to develop a narrative chronological history of your company's past relationship with computer vendors.

Auer is president of International Computer Negotiations, Inc. in Winter Park, Fla.

EMM Has Add-On for 370/168

HAWTHORNE, Calif. – The Multimemory/168 add-on storage system for IBM 370/168 systems was designed to increase the memory of a single processor by up to 8M bytes and the memory of a multiprocessor configuration by up to 16M bytes, according to its vendor, Electronic Memories & Magnetics Corp. (EMM).

The unit, which permits 168 users to upgrade existing systems, includes a deferred maintenance feature allowing an operator to detect memory failure on a lighted display panel and correct the failed memory block via a switch on the panel.

This removes the memory block from the system and restores address continuity, permitting maintenance to take place at the user's convenience, a spokesman explained.

The Multimemory/168 costs about $240,000 for 2M bytes of memory from EMM's System Equipment Division, 3216 W. El Segundo Blvd., Hawthorne, Calif. 90250.

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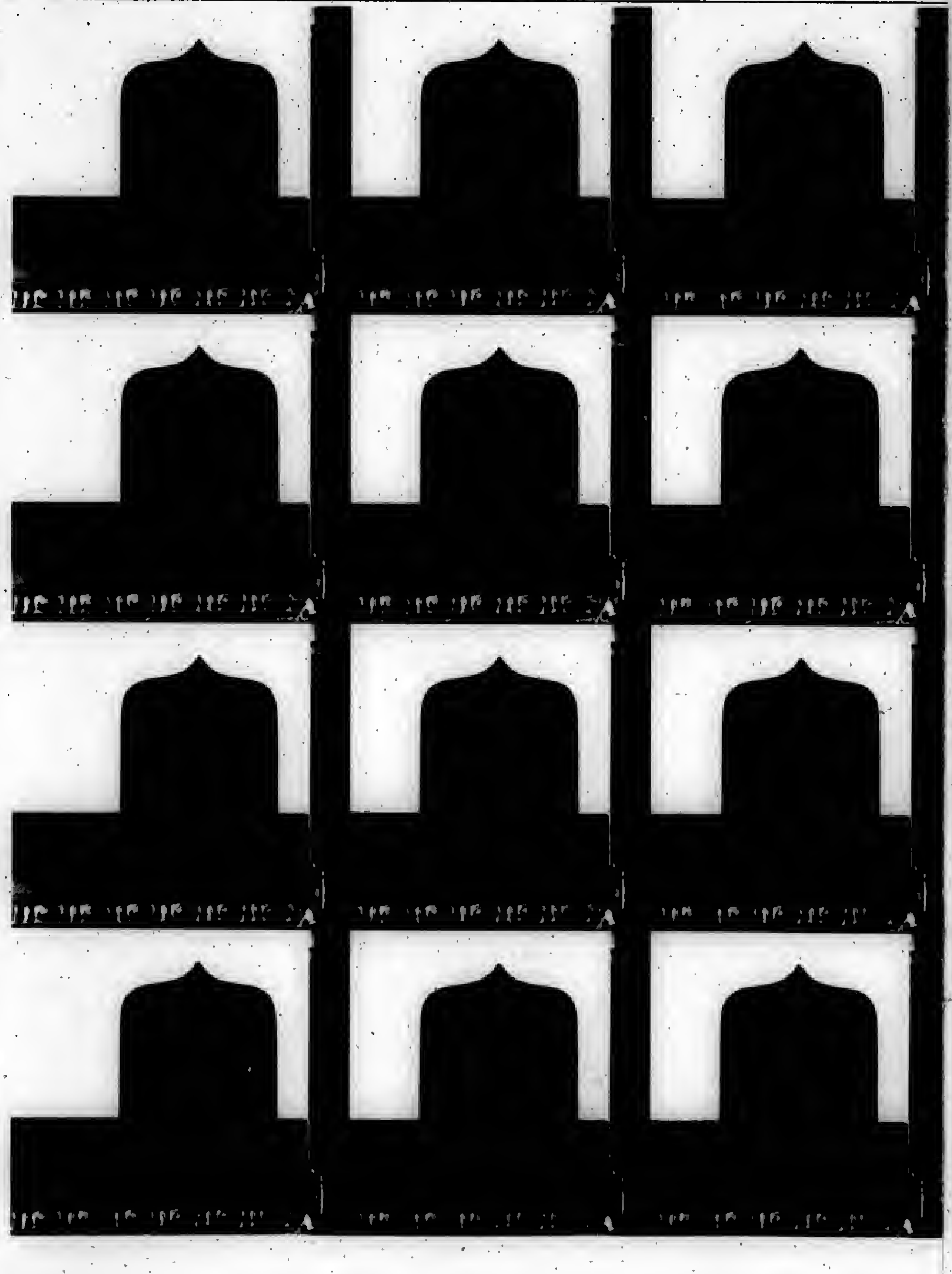


Inforex Software Enhances System 5000

BURLINGTON, Mass. – Inforex, Inc. has enhanced its System 5000 file management system with software that gives the user the ability to perform logical operations, validate data and reformat files and records, the company said.

Release 505 also features table lookup and multiple file access as well as 21 English language instructions that allow users to "custom tailor" their applications, Inforex said.

Available without charge to installed 5000s, Release 505 will be offered on all new System 5000 shipments at no Increase in price, the firm said.

The software does not require any additional memory or occupy any more overhead than the previous release, a spokesman noted.

With Release 505, users can customize many file automation applications without depending on skilled programming and systems personnel, he added.

The features allow operators to write their own procedure controls as well as edit routines, he explained.

A typical System 5000, including four terminals, a terminal control unit with tape drive, two 30 char./sec printers and a 25M-byte disk drive, leases for about $2,300/mo on a 42-month contract. The price would be about $104,000, the company said.

Inforex is at 21 North Ave., Burlington, Mass. 01803.

Identicon Unveils Reader, Extends Capability of 600

FRANKLIN, Mass. – Identicon Corp. has introduced another optical bar code reader for use with its bar code reading systems and has enhanced its 600 series of optical pen scanning systems.

The Model 515 bar code reader is available in two versions, one reading at a distance of 1/4 in. from the face of the reader to the label and the other at 1/2 in., Identicon noted.

The unit uses an integration technique that allows the reader to ignore voids in the dark bars and spots in the white bars.

The 600 series has been enhanced to include the two- and five-character supplemental encodations to the Universal Product Code (UPC), Identicon said.

The Model 515 costs $400; the 600 systems cost $1,200 for one unit of the single-channel OEM version or between $520 and $1,125 per channel for a 16-channel multiplexed end-user version.

Identicon is at 1 Kenwood Circle, Franklin, Mass. 02038.

Mixed Shop Goes To Third Party

(Continued from Page 33)

In addition to improving service, Halveland was able to save money.

"Our contract with RSC cut our maintenance costs by 22%," he said. "The money we saved enabled us to buy additional software to take fuller advantage of our system capabilities."

The archdiocesan system is used for a variety of purposes, including financial and academic recordkeeping for the 12,000 students in 15 high schools in the district. It also helps prepare materials, pledge reminders and reporting results for an annual fund-raising drive involving 145,000 persons in the area.

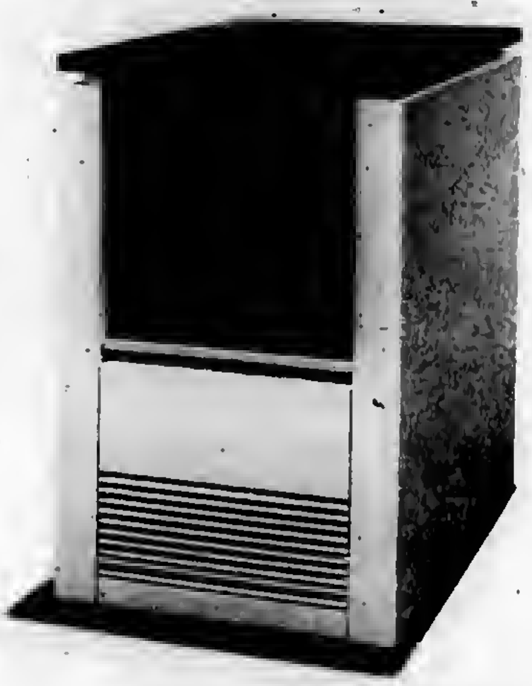
Another application on the system involves the handling of mailing and billing lists for the *St. Louis Review*, a weekly archdiocesan newspaper mailed to 85,000 readers.

According to Halveland, the 12 people at the center work on a shift and a half. All the applications programming was done at the DP department except for certain packaged utility programs.

Among the more interesting applications on the 360 is a system that keeps track of the religious orders in the archdiocese, Halveland said. It provides a personnel profile of the nuns and priests that includes where they went to school and their academic achievements, past ministries and special abilities.

This enables the district to "go into the system and find out who is qualified to teach calculus or work with Spanish-speaking people," Halveland said.

In another application, the system is used to perform time- and cost-accounting work for social workers who are employed by Catholic charities.



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Replaces Teletypewriters

System Processes $6 Billion/Day in Money Transfers

By a CW Staff Writer

CHICAGO – The First National Bank of Chicago (FNBC) is processing some $6 billion a day in money transfers using a minicomputer system, according to a bank spokesman.

FNBC has interfaced the minicomputer system with the Federal Reserve Bank Transfer Network (Fedwire), which is responsible for transferring funds between banks.

The bank's previous teletypewriter communications used to transfer funds was considerably slower and subject to error, according to Daniel Dinges, operations officer at FNBC.

With the minicomputer, "we have increased the daily number of output items from 500 to 1,100 with no increase in staff," Dinges noted. "The current error rate is extremely low and, we believe, very competitive."

The decision to purchase a minicomputer was made by a committee with representatives from the DP staff and the various affected operating units which drew up a decision table reflecting a consensus of their criteria, Dinges said.

The table was weighted very heavily toward least cost/best performance concerns, he added; when the various systems were considered, those that had a minicomputer architecture received higher scores.

A Varian V-74 was chosen after a technical support staff of hardware analysts compared it to some others, he said.

Individual transfers on the automated system at FNBC are often in excess of $50 million.

Sears, Roebuck & Co., for example, may call FNBC and ask the bank to transfer funds from its account to another company's account at Chase Manhattan Bank in New York. After FNBC verifies that the request was made by an authorized person and that sufficient funds are in the Sears account, transfer instructions are given to an FNBC operator at a CRT terminal linked to the mini.

The operator then enters the fund transfer into the system. The mini expands the message via file searches and formatting programs to create a message for Fedwire.

Most banks compose Fedwire messages by manually searching documents, but the mini retrieves such information as the number, status, title and address of the account, the American Banking Association number and the Fedwire abbreviation for the bank receiving the funds from its disk files.

After the standard Fedwire message for the Sears transfer is formatted, it is sent to the Federal Reserve Bank in Chicago, which takes the money from the FNBC account and sends a message to the Federal Reserve switching center in Virginia.

The Virginia center then routes the message to the New York Federal Reserve Bank, which credits the appropriate Chase Manhattan account.

Incoming transfers to FNBC are received by the system without human assistance.

When the Federal Reserve system falls behind in its data processing, the minicomputer queues the messages and empties the queue at the first opportunity. This feature becomes particularly important as the Federal Reserve's 2 p.m. (Chicago time) deadline for the same-day money transfers to the East approaches.

After 2 p.m., FNBC may be subject to a one-day interest liability fee on transfer funds it still holds.

The FNBC system has 96K words of memory, two disks, two tape drives, two high-speed printers and two paper punches.

The system also enables the bank to more effectively oversee its reserve funds. FNBC is required to maintain reserve funds equal to a composite percentage of its various types of deposits, which the Federal Reserve checks weekly.

Software Development Called Micro Users Bane

By Toni Wiseman
Of the CW Staff

LOS ANGELES – "With the very attractive and ever-decreasing microcomputer hardware prices acting as a magnet to potential users, software development looms as an ever-increasing proportion of a user's overall investment in a given application," Duane Dickhut told the recent Western Electronic Show and Convention (Wescon) here.

Dickhut, from Digital Equipment Corp., noted software development tools have become a key factor in the overall success of a user's project. Selecting the proper tools is becoming a more important decision, he said.

Microcomputer software tools, in order to match the attractive hardware prices, should retain the minicomputer's properties of flexibility and ease of use, but offer better price performance and packaging, he proposed.

"One of the best ways to evaluate development tools is to actually get hands-on experience," he stated, adding the user should explore whether both Assembly and high-level languages are offered; whether the assembler has a macro facility; and whether the operating system comes "ready to run" rather than being generated.

Users should also check to determine if other utilities, such as interactive batch capability, are included.

"A potential user who has an application that he perceives may be solved by either a low-end minicomputer or a microcomputer (or microprocessor on a board) wants to certainly evaluate the available software development tools as a key component of his decision-making process on whether to use a mini or a micro," he said.

A potential user doesn't want to fall into the trap of being enticed by low hardware prices and merely assuming the software development will be as expensive, he cautioned.

It is relatively easy for the potential user to evaluate, by many means and through various sources, minicomputer software development tools, Dickhut said.

"He will probably conclude that those tools offer flexibility, ease of use and field-proven maturity in a reasonable price/performance package.

"With microcomputer software development tools, however, the evaluation process is not that easy, primarily because of the industry's infancy," he said.

The First Step

The first step is therefore to perform an inventory of what comes in a package when it is bought and whether it consists of a true operating system or stand-alone programs, Dickhut said.

An operating system manages the system's resources efficiently and effectively so a programmer can be more productive and focus on the immediate task at hand, he said; with a stand-alone program, however, he has to worry about managing the system's resources.

"A major aspect to determine from the kit is what languages come with it and, more importantly, what languages are optionally available that will run under the operating system.

"The amount of language support is crucial to flexibility for the user in that he has the freedom to either implement his application in Assembly language or a high-level language such as Fortran or Basic," he said.

The user's schedule, available development dollars and software transportability will be the driving function in selecting an implementation language, he explained.

Another consideration is the macro assembler, he said. While it may not be deemed essential at first, a good macro facility can allow a user to assemble other microprocessor instruction sets by simply writing a set of macros, creating a source file in the target machine's language and passing that source file along with the macro definitions through the macro assembler on the development system, he observed.

This means the user can take advantage of this flexibility by not having to purchase a software development package for every microcomputer he buys, he noted.

Finally, the package should be examined for other utilities such as a debugger, a file manager and an editor that creates and modifies other source packages.

NCR Hikes Century 151 Memory, Cites Trend to On-Line Systems

DAYTON, Ohio – NCR Corp. has increased the amount of memory available on the Century 151 system in response to trends toward multiprocessing and on-line/real-time systems, the firm said.

Formerly available with a maximum of 128K of memory, the Century 151 can now accommodate up to 256K. Users can upgrade their systems in the field up to 128K for a charge of $10,000 for each additional 32K of memory; further upgrades cost $10,000 for each 64K thereafter, not including the installation charge, NCR said.

The memory uses 64K-byte boards with 4K MOS random-access memory (RAM) chips. The memory can be contained in the existing processor and auxiliary cabinet, the firm noted.

The expanded memory was designed to allow users to implement larger multiprogramming systems and use Resident Sector Management (RSM) software with virtual memory techniques.

A basic Century 151 with 192K of memory, card reader, line printer, 9.8M bytes of disk, thermal printer, four I/O trunks and auxiliary cabinet costs $149,925 or $3,675/mo on a five-year lease.

The system with 256K costs $159,925 and rents for $3,975/mo on the five-year plan, NCR said from Dayton, Ohio 45479.

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PRIME

System 'Almost Limitless'

Mini Soothes Company's Growing Pains

By Esther Surden
Of the CW Staff

MELVILLE, N.Y. – An electronic components manufacturer here has found its minicomputer systcm has given it the necessary flexibility to deal with its growing pains.

International Components markets and distributes electronic components for OEM and replacement areas. Products include resistors, capacitors and semiconductors as well as electron tubes, according to Elihu Zucker, vice-president and controller of the firm.

The company was prompted to purchase a minicomputer when its growth outstripped the capabilities of its former systems. "We had two Burroughs 6000 magnetic card systems and still couldn't keep up with the work. It was taking us seven or eight days to prepare month-end reports," Zucker recalled.

Because of previous good experience with Burroughs systems, the company decided on a B1712 with a 64K memory, two dual-disk drives, two 96-column off-line keypunches and one on-line keypunch. The system cost the firm $115,000 when purchased.

Formerly, the two 6000 systems worked 24 hour/day, Zucker noted. Now the DP department is on an eight-hour shift with a DP manager who is also a programmer; a computer operator; and two keypunch and edit personnel.

Applications on the system include inventory control, sales analysis, accounts payable, check writing, payroll and billing.

In the future, the company plans to put disk packs on the system because of an increasing number of transactions and the amount of record information being developed. The packs will allow the firm to expand its on-line memory capacity.

The firm also expects to put CRTs in the inventory and credit departments. Inventory control is presently taken care of via a weekly report, but the firm would like the accuracy of having the system on-line. The CRT in the credit department could perform credit checks.

The system, Zucker added, "is as good as your imagination." International Components started with canned application programs which are now taking on the firm's own personality, he explained.

The system's ability to perform is "almost limitless," he added, and its flexibility has been a great help to the company.

Mini Bits

Government, Business Use Topic of AIIE Conference

WASHINGTON, D.C. – A conference on minicomputer applications in government, business and other organizations will be sponsored by the American Institute of Industrial Engineers (AIIE) here Dec. 6-8.

The conference costs $265 for AIIE members and $295 for nonmembers. Information is available from AIEE at P.O. Box 3727, Santa Monica, Calif. 90403.

Exchange Set Up for SR-52 Users

DALLAS – Texas Instruments, Inc. (TI) has set up an exchange center here for current and potential SR-52 programmable calculator owners.

The Professional Program Exchange makes specialized programs in professional categories contributed by other professionals available to the users.

A $15 annual membership fee entitles users to a catalog that lists available programs and updates, a newsletter and three free programs of their choice. Additional programs cost $3 each, TI said.

The exchange can be reached through PPX-52, P.O. Box 22283, Dallas, Texas 75222.

Hands-On Micro Meeting Scheduled

AMES, Iowa – A conference on microprocessors and microcomputers with a hands-on, laboratory-oriented approach is scheduled at Iowa State University Nov. 15-19.

Topics will include operation codes, introduction to the peripheral interface adapter (PIA), microcomputer systems applications using the PIA and some systems design examples using microcomputers.

The registration fee is $295. More information may be obtained from Roger Camp, 332 Hoover Hall, Iowa State University, Ames, Iowa 50011.

E&L Plans Micro Training Seminar

SPRINGFIELD, N.J. – E&L Instruments, Inc. will present a two-day training seminar on microcomputers in Kennilworth, N.J. On Oct. 9-10.

No previous experience in digital electronics or microcomputers is necessary, the firm said, and enrollment will be limited to 30 people.

Cost per student is $80 from Shortess-Rawson and Associates, 155 U.S. Route 22, Springfield, N.J. 07081.

System Industries Cuts Disk Price

SUNNYVALE, Calif. – System Industries has reduced the price of its 3500 cartridge disk subsystem by about 20%, the firm said.

The 2.5M-byte moving-head unit formerly cost $8,800. It now costs $7,200, making the unit useful as an alternative to floppy disks, a spokesman claimed.

The system, which is based on the Diablo 30 series drive, was designed for the user whose data requirements will grow to 300M bytes. The price reduction is the result of "economies in manufacturing," the firm said.

System Industries is at 535 Del Rey Ave., Sunnyvale, Calif. 94086.

Sola Adds Voltage Regulators

CHICAGO – A line of voltage regulators from Sola Electric designed for use with minicomputers is said to offer complete isolation from the power line.

The portable units feature quiet operation and are simple to install, the vendor said.

Prices for the units start at $340. Sola is at 1717 Busse Road, Elk Grove Village, Ill. 60007.

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Winery System Brews Annual Savings of $10,000

By Bertram Silk
Special to Computerworld

CANANDAIGUA, N.Y. – Blending calculations at Canandaigua Wine Co. once took a winemaker three to four hours daily. Since we installed a small business system, these calculations take less than 30 minutes, and we are saving $10,000/year.

We had many applications in mind when we decided to search for a small computer – blend calculations, inventory pricing, government records, tank records and some personnel records. We justified the purchase of the Wang Laboratories, Inc. 2200 using the first two – blend calculations and inventory pricing.

Pricing the inventory formerly took three to four man-days each month. The system has reduced that to about four hours a month.

The time saving in just these two applications represents a dollar saving for us of approximately $10,000 per year – enough to repay our investment in the unit.

Further, the system is accurate in its calculations and we have printed information to give to our winery crew.

Personnel Listing

After bringing up our inventory pricing and blend calculations applications with software developed by a local vendor, Dynamic Programming, Inc. of Rochester, we added a personnel list with employee names, addresses and phone numbers.

Our personnel manager keeps the list up to dste, and one benefit of maintaining the list on our own system is the ability to generate our own mailing labels for our employee publicstions.

Before we purchased the Wang computer, we had installed an IBM 3 to handle most of our front office DP. It would have been possible to implement inventory pricing and blend calculation on that system by adding more terminals, but we reasoned that the Wang 2200, which uses Basic as its software language, would prove easier to program.

Although we experienced some difficulties with software in the early stages of our system development, those problems were solved and we are convinced that, in terms of programming, we made the right decision.

Canandaigus's configuration consists of a 2200 desktop system with self-contained CRT, keyboard and cassette tape drive; a diskette for data storage; and a 200 char./sec printer.

Preparing Work Sheets

Our winery planner uses the system each morning while preparing the day's work sheets. The planner begins by loading the system's diskette unit.

The planner first enters the number of the tank with which he wants to work. Given thst tank number, the computer displays the current volume of that tank in gallons, the current liquid level in inches and the total capacity of that tank.

The winery planner can then enter the amount to be added to or subtracted from that tank with a simple keyboard command.

After the planner hits the EXECUTE key, the 2200 displays the new volume, level in inches and total capacity of tank number three.

The updating of the disk is done by a clerk at the end of each day, after the completed work sheets have been returned.

Using the same diskette the winery planner used that morning, the clerk calls for the "set up daily tape" software routine with a keyboard command. Operating again in question-and-answer format, the computer asks the clerk to enter the first work order number.

Next, the operator responds to a request for the number of the tank from which material was transferred in accordance with that work order number. In response to thst number, the computer displays that tank's final observed level in inches.

The computer then asks the number of the tank to which material from the first tank was moved and displays the final observed level in that tank.

At the end of each month, Alan Sterling, our supervisor of government records, loads the "wine" diskette, calls up a "list inventory" routine and presses the EXECUTE key.

The unit responds with a printout categorizing the contents of every tank in the winery both in terms of lot number and classification of tank contents, i.e., tanks holding material, fermenting wine, wine less than 14% alcohol, wine 14% to 20% alcohol, wine 21% to 23% alcohol or empty tanks.

Our winemaker uses the computer for approximately two hours in the morning and in the afternoon to calculate as many as seven blends in s single session. The winemaker learns each day from the winery planner the quantities of each blend needed. The winemaker knows the specifications, the materials and the approximate quantity of each material needed to produce each blend; the computer helps him refine those approximations.

The winemaker also knows the key characteristics of each required material – its color, brix, degree of alcohol, acidity and potassium and sulfur dioxide content.

After the winemaker's diskette is loaded into the 2200, the unit, again with question and answer routines, asks how many variables are unknown, thst is, what quantities of how many materials the computer must calculate.

Typically, the winemaker will respond by keying in the number "1," having been sble to specify the quantities of other materials needed in that wine.

Then, for each material in sequence, the winemaker keys in the number of the tank in which that material is contained, the lot number and the results of tests on thst lot: percent of alcohol, degree of brix, color reading, acidity level and parts per million of potassium and sulfur dioxide.

He then enters the percentage of each material or a question mark if that material is to be the unknown variable.

The printout produced after all of those entries have been made for each material lists the quantities in gallons of each material needed to produce the necessary quantity of that particular blend. In its blend calculation application, the computer acts as a check on the winemaker's preliminary calculations.

Silk is vice-president of winery operations at Canandaigua Wine Co.

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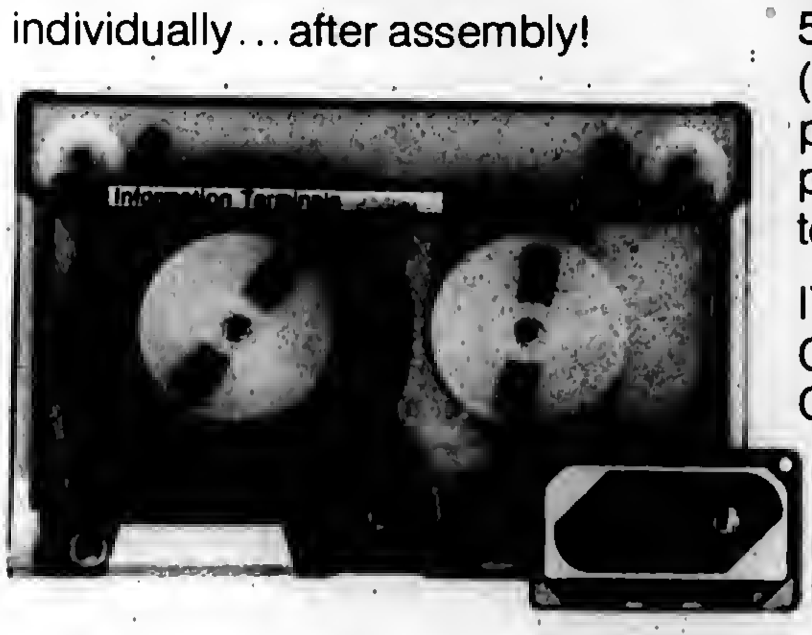

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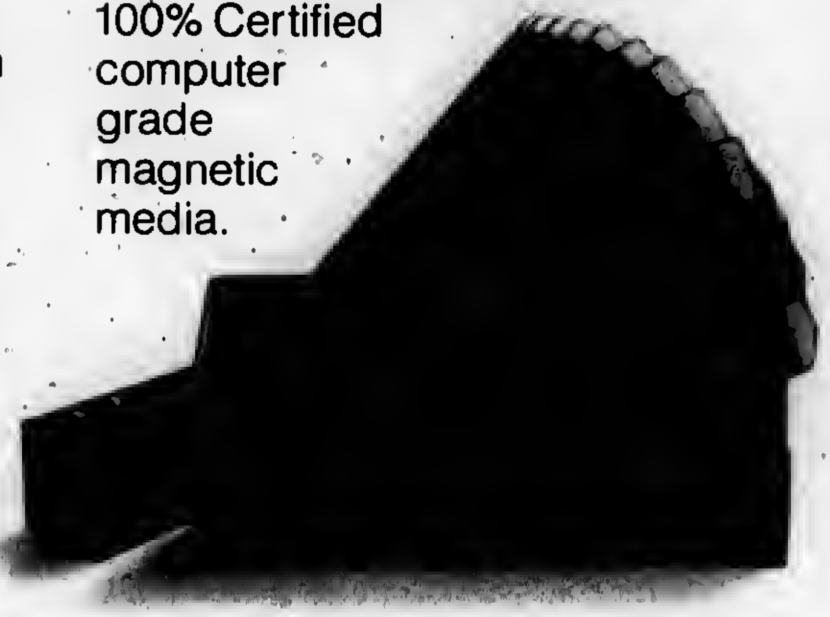

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System Brings $40,000 Savings

College Makes Use of Mini Stashed in Basement

By Esther Surden
Of the CW Staff

SAN FRANCISCO – Although a "Do Not Disturb" sign doesn't really hang on the minicomputer at Golden Gate College here, the system is hidden away in the basement to keep it in the same condition it has been in since it was purchased in 1973; according to Dr. John Lehane, chairman of the Information Science Department.

The 24-bit Basic Timesharing, Inc. (BTI) minicomputer with 10M bytes of disk is accessed from user terminal sites within the building and by a portable terminal, Lehane said. The mini is a stand-alone unit and requires no operator, he added.

Before purchasing the system, the school had been using commercial time-sharing services, Lehane continued, with the monthly bill coming to about $3,000.

The system cost about $56,000 when purchased and has been upgraded with additional disk for about $10,000 more. The savings since the time the school installed the system amount to over $40,000, he said.

Maintenance Factor

The school consulted various mini manufacturers before choosing the BTI system. The minis considered included the Hewlett-Packard (HP) 21F, the HP 3000 and Data General Corp., Microdata and Varian systems. The BTI system was chosen on the basis of its price/performance ratio, Lehane said.

Another attractive feature of the system was its maintenance, he added. The BTI system can be serviced remotely from the vendor's home office, eliminating the need for a costly maintenance contract.

"The other vendors were talking about a $300/mo maintenance contract on the systems," Lehane said, "and that amounted to a great deal of money over several years."

The system has been down only once since the school installed it, he continued, and that was because of a power supply failure. Occasional system stoppages are often taken care of by just restarting the CPU.

The college, which teaches business and public administration as well as law, uses the system for various academic subjects such as financial analysis and statistical analysis as well as some administrative functions.

Basic is the only language taught on the system, and courses that require Cobol must use an outside service. About 2,000 students taking 30 courses use the system.

The mini has eight time-sharing ports directly connected to five teletypewriter terminals and two Execuport 1200s from Computer Transceiver Systems, Inc. One portable terminal is used outside of the building and is connected over phone lines.

The CPU runs 24 hours a day, seven days a week, Lehane said, allowing students to access it at almost any time. The only time the system must be scheduled for use is toward the end of the marking period, when projects have to be completed, he noted.

The school is instituting an information retrieval system on the mini, Lehane said, to tell if a book is located in the college's various libraries.

The plant manager also keeps an inventory of the physical goods on campus with the system, he added.

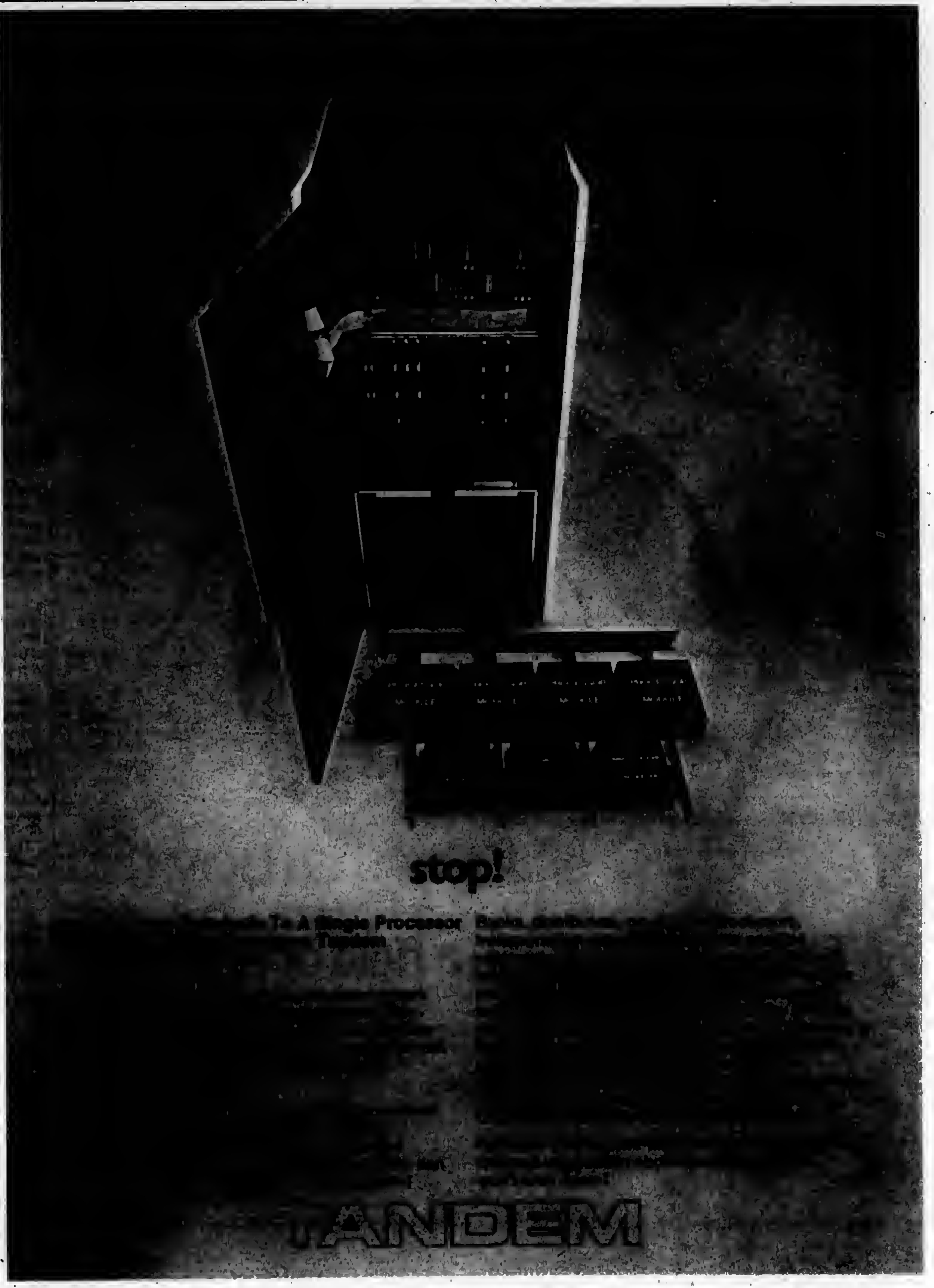
NCR Has Turnkey For Restaurants

DAYTON, Ohio – A minicomputer-based sales analysis, inventory and cost-evaluation system for small to medium-sized restaurants is available from NCR Corp.

Three application modules are used by the NCR 499-based system when it is employed in front-end or input operations, NCR said. They process data from electronic cash register memory, data recorded on cassettes by the registers and data from either an NCR 7200 data capture terminal or entered through the NCR 499.

A fourth module processes sales and inventory transaction data generated by the other three modules, the firm said. The system creates and maintains three master files for processing, including the menu master file, the consolidated menu master file and the inventory master file.

A basic system with 20K of memory, a continuous forms feeder and three cassettes cost $24,800. The modules cost $750, $600, $700 and $1,750 respectively and will be available in the fourth quarter, NCR said from Dayton, Ohio 45479.



System Helps Aluminium Plant Assess Metal's Purity

FERNDALE, Wash. – A minicomputer here is helping one of the nation's largest aluminum reduction plants produce blends of metal for its customers, the user said.

Intalco Aluminum Corp. annually produces 265,000 tons of aluminum – one ton every two minutes around the clock – and now uses an IBM System 7 for continuous spectrometric analysis in production.

"The system examines the purity of each sample of metal produced during 21 shifts per week from our 720 electrolytic cells which are in constant use," according to Roy G. Cunningham, Intalco's DP superintendent.

"In addition to pot sample analyses, we perform casting sample analysis and ladle analysis. This program contributes significantly to optimizing the use of different metal purities into compatible alloys being produced," he added.

Samples are taken from each pot with a vacuum dipper every four shifts. The samples are then lathed to a single smooth surface. This surface is exposed in the spectrometer and, by measuring the iron and silicon present, Intalco learns how each cell is performing.

Results are accumulated by pot for a continuous record and an indication as to when scheduled pot maintenance should occur.

Ladle analysis is performed daily to produce a suggested tapping sequence for the following days.

In addition, Intalco workers sample furnaces in the cast house for blending results and for metal certification. When ingots are sent to the extrusion plant or rolling mill, each must meet a specific chemistry and physical profile and must carry a company certification.

Continuous sampling prior to cast house blending and during pouring from the furnaces produces samples for certification.

During each sampling cycle, the system receives voltage data from the mass spectrometer indicating the presence and parts per million of 21 elements. The metallic standards are continuously calibrated for accuracy via the computer.

Each result is tallied on a single computer-printed sample report, checked against customer specifications and stored electronically by the computer for future reference.

Linked by telecommunications lines with Intalco's central IBM 370/125, the System 7 also relays data collected from on-line process computers for production reporting and planning purposes.

"We are using computers here," Cunningham said, "to make our plant operate as productively and smoothly as possible, producing the highest quality aluminum as quickly and as economically as possible.

NCR Turnkey Handles Accounting For Small Physician Practices

DAYTON, Ohio – A system designed to meet the accounting needs of the small physician practice has been announced by NCR Corp.

The turnkey system is based on the NCR 299 and includes two basic applications, patient billing and accounts receivable.

The patient-billing program prepares a statement with five credit descriptions and up to 70 service descriptions, the company said.

The billing program can also generate self-addressed return envelopes to reduce the turnaround time on bills, a spokesman noted.

The accounts-receivable program posts all payments; balances any refund that has to be made and provides an aging analysis of the receivables, he added.

The system includes an NCR 299 processor with magnetic ledger handler and costs $12,500. NCR is in Dayton, Ohio 45479.

Datum Has Transport For HP 9830 Users

ANAHEIM, Calif. – A cassette transport configuration provides Hewlett-Packard (HP) programmable calculator users with 300,000-character storage at 30 in./sec read/write speed, according to its vendor, Datum, Inc.

The system was designed to complement the calculator's internal memory with additional mass storage for programs or data, the firm said.

The recorder interfaces with the calculator through HP's data communications interface cards and with other devices through its three internal channels, Datum said.

Available in two configurations, the single-transport, desktop unit is 8 in. by 12 in. by 16 in.

The dual-transport, rackmounted unit is 8.75 in. by 19 in. by 18 in. Weight is 40 pounds; power required is 100W at 115V, 60 Hz.

The Model 4000 single-transport unit costs $2,825; the dual unit costs $3,725 from Datum's Timing Division at 1363 S. State College Blvd., Anaheim, Calif. 92806.

Spear Enhances Clacs With Analyzer Interface

WALTHAM, Mass. – B-D Spear Medical Systems has enhanced its minicomputer Clinical Laboratory Automated Computer System (Clacs) to allow it to be interfaced to a wide number of chemical analyzers as well as other hospital computer systems, the firm said.

An editability program has also been added to the system which permits users to handle day-to-day changes in test procedure parameters at a CRT.

Based on the firm's own minicomputer, a basic configuration includes a CPU with 16K of memory, two 200 line/min printers, two CRTs, software and training.

The system costs about $99,500, the spokesman said from 123 Second Ave., Waltham, Mass. 02154.

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CI Notes

Inforex Buys Beehive CRTs for New Product

BURLINGTON, Mass. – Inforex, Inc. intends to enter the intelligent terminal market and has signed a two-year contract valued at about $7 million for terminals from Beehive Medical Electronics, Inc.

Under the agreement, if Beehive cannot supply a version of its B800 and B100 in needed quantities, Inforex may obtain manufacturing rights.

Inforex is developing software and is planning future product announcements within six months, a spokesman said.

DEC Sights Vermont Site

MAYNARD, Mass. – Digital Equipment Corp. is heading for the hills of Vermont in its latest round of space acquisition.

The firm has agreed to acquire 180 acres in South Burlington for the future site of a manufacturing plant and has signed a lease for 32,000 sq-ft in a Sperry Rand building in nearby Colchester.

At Colchester, it expects to build an additional 28,500 sq-ft plant by mid-1977, a spokesman said. Colchester will be used as a pilot manufacturing operation, he said.

He was, however, unable to specify what product line will be manufactured in Vermont.

BST Gets Lease Financing

SANTA ANA, Calif. – Business Systems Technology, Inc. (BST) plans to provide lease financing through its new limited partnership with Girard Leasing Corp., to be known as GBS Leasing Associates, Ltd.

Under the partnership, several million dollars of financing will be available yearly, according to Dion Cairns, BST's vice-president of finance.

Views on Leasing - Part 1

IBM Saw NS Hurting Leasing Industry

By Molly Upton
Of the CW Staff

NEW YORK – "For the first time, the [computer leasing] industry will face head-on competition from its previous benefactor – an aggressive IBM sales force."

This quotation is from an IBM market evaluation study written in 1968 which detailed how the introduction of New Series (NS) equipment, later known as the 370 line, would force the leasing industry into a profit squeeze, if not negative results.

The report, Plaintiff's Exhibit 3455, and other market evaluation studies have been entered as evidence by the Justice Department in its antitrust case against IBM.

IBM seemed to view the NS as an attack, or counterattack, on the "glamour industry" which had eaten into its lease base, the study indicated.

IBM Trial Documents

Calling obsolescence the "Achilles heel of the leasing industry," IBM strategists revealed how the NS would affect lessors.

The new systems, expected to be available by 1972, would force the leasing industry to increase its discounts to the 40% to 50% level, moving the break-even point out to 1978 and beyond. This would occur when the average age of lessors' inventory had not reached the midpoint of its 10-year life, the report indicated.

IBM expected the leasing industry, which it said viewed the world through "rose-tinted glasses," to continue to buy 360s without forethought of obsolescence.

"As the specter of 40% and 50% discounts become a reality, the shining light on the leasing industry will begin to fade.

"It will become abundantly clear that any return on 360 investment is by no means a certainty – because the effects of the fourth gencration will cause the industry's 1970 record earnings to turn abruptly downward.

"Even massive investments in NS, and its competitors, will not produce enough 'book' profit to prevent industry earnings from coming periously close to *no profit* in 1973," the report said.

"We expect the leasing industry's 360 revenue and profit growth to terminate in 1970. Beginning in 1971, as the effects of fourth-generation equipment take hold, revenue from 360 will begin to decline – but profit will *drop* as costs, i.e., depreciation, maintenance, interest, etc. refuse to disappear."

The leasing industry, the report explained, "has placed its 'bet' on one basic element – life."

(Continued on Page 44)

Software, Semis

DP Growth Rate – Sharp or Sloping?

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. – The growth rate of the computer industry was debated by speakers at the recent IEEE Computer Society's Compcon '76 meeting here.

Although it was generally conceded dcvclopments in the industry fit an "S"-shaped learning curve, the disputes centered over whether the industry faces the slow, steady growth of the upper and level part of the "S" curve or whether its developments and breakthroughs will continue to occur at the exponential rates portrayed in the steepest part of the graph.

Looking at the software and particularly at the learning curve for programmers, Elaine Bond, manager of programming for IBM's System Products Division, stated she sees a mature, managed and steady growth rate which will have its effect on the industry as a whole.

But looking at the likely innovations in computer architecture over the next five years, Richard J. Clayton, vice-president for computer systems development at Digital Equipment Corp. said the industry has just begun in terms of the systems it will install and the people it will involve in computer use.

For Bond, the steady leveling off of growth comes with the need to treat software and its production more as a business and less as the art it has been considered in the past. She focused on managing the creation of software, and on the technology of software design.

Bond urged her audience to involve programmers in the business of turning out programs, noting "programming is still labor intensive; there is no substitute for skilled people."

IBM now spends more money earlier in software development than it used to in hopes of shipping fewer errors along with its final product, she said.

By designing tightly managed systems for programming like that used in her company, Bond suggested a 50% to 100% improvement in programmer productivity is possible.

Fundamental Forces

While Bond emphasized a refinement of skills, techniques and technology already available, Clayton maintained the nature and shape of the computer industry over the next five years will be determined instead by technological forces that are "fundamental, fast and formidable."

Clayton noted the basic physics of the industry are in place. He agrced with Bond that recent investments in software technology have improved the ability to write software, adding those investments are "impressive, large and rapidly growing."

Technical drives and particularly those that are semiconductor-oriented, however, will be primarily responsible for industry growth, he asserted. These drives, in turn, will create a matching marketing drive leading to "exponential growth in the number of installed systems – programmable and somewhat general purpose, Clayton said.

Memory bit densities will increase at nearly 89% per year for the next five years, he predicted. Disk storage will increase 41% per inch of surface each year for the next five as well.

Charge-coupled devices and bubble memories are on their way and are important as intermediate storage devices in terms of cost and access time, Clayton stated.

In what he called the "computation area," the means for collecting "logical elements" on circuits are coming together at speeds of about 60% per year, the DEC vice-president noted.

Reasonable ways of obtaining economies of scale in such semitechnical areas as processing, protocols (particularly in communications systems) and cache memories are also "in the bag in the labs today," Clayton stated.

"This is the nature of the

(Continued on Page 45)

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DPF Moves to Combat IBM Strategy By Offering 370/138, 148 for Lease

By Molly Upton
Of the CW Staff

HARTSDALE, N.Y. – "The best defense is a good offense," DPF, Inc.'s vice-president of marketing said recently in explaining the firm's campaign to offer 370/138s and 370/148s on operating leases.

Although he admitted the smaller purchase-lease ratio offered by IBM on its new machines is "terrible news" to lessors because it gives them a smaller umbrella under which to operate, "we're opportunists," Tony Pintauro said.

By offering flexibility and taking greater risks on its equipment, DPF intends to capitalize on the latest IBM move, he said. "The only way you can compete against IBM is to take more risk," he added.

In explaining DPF's strategy, he said that when IBM announces something like the 138 and 148, the world stops doing business with leasing companies for a while.

"We had a number of objectives: letting the world we deal with know that we're still in business, that we're willing to go with 135s, 145s, 138s or 148s and that we're willing to look at their problems. This is in order to maintain our customer base," he said.

In addition, "there are a number of people who may not have the full story on the 138 and 148, so we'll present a 135 or 145 as an opener for sales.

"We've had IBM's complete line for the past 10 years, which IBM isn't offering. I may own 135s which I'm buying at 65% of original cost that perhaps meet the cost performance of the 138. We'll have to take a look at the numbers," he observed.

"A customer may have a 135. In going to a 138, he's going to have a bit of a problem because he'll lose his rental accruals. So we'll purchase it and lease it back, let him use his rental accrual, pass some of it through to him and give him an upgrade to a 138 or 148."

Another potential customer would be the user who wants flexibility in the future, he said. For instance, the user might want a 360/65 for a couple of years and then an upgrade to a 148.

DPF is in the business to "offer an alternative to the guy who wants to deal with IBM," Pintauro said.

"In the past, we've found out empirically that when IBM has a small purchase price to lease ratio, as it does with the 138 and 148, for some reason the customers hesitate because they envision another announcement.

"If they see a purchase-to-lease ratio of 52, they'll say IBM's going to be in this for a while because it's waiting longer to get its money back. But when the users see a purchase-to-lease ratio of 39 they'll say, 'Aha, somewhere along the line there's going to be another announcement,' " Pintauro said.

What DPF is trying to do is to demonstrate some kind of continuity to the user, he added. The offer is drawing a lot of response, he said.

"At 90% of IBM's best four-year term plan, a guy can save himself 10%, he has the machine he wants and we have just a little greater risk than we like to take, but in order to stay in business we may have to take it," he said.

IBM Saw NS Hurting Leasing Industry

(Continued from Page 43)

Later, it remarked, "With System 360, leasing companies have offered users a 'deal' that could not easily be resisted. The deal included the same products and services and almost the same flexibility offered by the manufacturers – all at a lower cost. The only problem for leasing companies is – life.

"The survival of third-party computer leasing as an industry depends upon the extent to which individual companies can 'weather the storm' of the early 1970s," according to the report.

For those firms that would survive, IBM foresaw a different role in a few years: "In the mid-1970s, we believe that observers will, in retrospect, look at early computing leasing activities as the means by which companies gained and supported footholds in the DP services field.

"In essence, third-party computer leasing may well by then have taken a supporting role to ventures such as software development, consulting, information marketing and even peripheral equipment manufacturing," the report said.

Concerning the current lessor attitude about continued status quo, the IBM report said, "Although leasing executives talk of the potential problems of obsolescence, we see no real selectivity of purchases or evidence of a slowdown – but the *reality* of a 'fourth generation' will cause an agonizing reappraisal."

The pressure for lessors to initiate large discounts will come from several sources, both IBM and other lessors, the report indicated.

The NS would offer 360 users "equal or more performance at lower cost." The IBM sales force would be making proposals for these systems since sales liability for 360s would have ceased; an additional incentive to discount 360s would be that other lessors would be offering the new equipment, IBM said.

The report spelled out how aggressive its sales force would be: "NS production schedules will generally not deter early displacement of leasing company 360s as the IBM salesman will give priority – first attention – to these gross equal net situations, and leasing companies, usually owning only 75% of the users' systems, have a limited base over which full system discounts can be spread."

The report also detailed how and why lessor-owned machines would be primary targets of the sales force.

"Upon announcement, *first* sales calls will be made to those accounts where leasing company machines were purchased prior to 1968 – these carry only a two-year liability.

"If we assume a 12- to 18-month delivery schedule in the first half of 1971, an IBM salesman could propose against a leasing company machine that was purchased in *June of 1968* – purchases subsequent to Jan. 1, 1968, carry a four-year liability."

Of significance was IBM's commission scheme for 370s. The salesmen would be highly motivated, for they would make full gross commission regardless of whether they sold an upgrade or a downgrade, a 1969 study observed.

The 1968 study indicated firms might avoid a shaking out if they "become correctly selective in their third-generation purchase programs, ultimately terminating these programs and switching to NS; counter some of NS' advantages through such things as customized software; utilize 360 equipment in DP-related activities, such as computer networks; and find areas of diversification that will dampen 360's effect on their [profit and loss statements]."

The report summary suggested "IBM management should consider third-party leasing as an industry in which *reported* profits will continue to grow until the early '70s – when liberal accounting and an obsolescent inventory will force an agonizing reappraisal. It is conceivable that third-party leasing will take a secondary and supporting role to evolving DP and service activities."

CDC, Iran Form Terminal Maker

MINNEAPOLIS – Control Data Corp. has taken a 30% interest in its latest joint venture firm, Computer Terminals of Iran (CTI), formed in conjunction with Iran Electronics Industries.

The total capital investment in CTI is about $25 million.

CTI was established to design, develop and manufacture advanced computer display terminals. Initial production of terminals, incorporating plasma display technology, is expected to begin in 1978, according to CDC.

Following initial development, which is currently under way at CDC's Roseville, Minn., facility, production will be established in Shiraz, Iran.

An Iranian development team will participate in the Roseville efforts and relocate to Iran, where it will continue R&D and technical support of manufacturing.

CDC's representative on the three-man CTI board is E.E. Strickland, a vice-president and senior staff officer.

In Next Five Years

Univac Sees Annual Net Growing 15%

BLUE BELL, Pa. – Univac officials indicated future product plans as they told analysts here recently the firm expects an average annual growth in profits of 15% in the computer business over the next five years.

The company's ability to more than double computer revenue, profits, assets and installed base over the past five years, despite the effects of two recessions, has solidified Univac's second-place position in the industry, officials said.

"Our future growth goals are both realistic and achievable," Gerald G. Probst, Univac president, said.

During fiscal 1976, Univac revenues from computers accounted for 44% of Sperry Rand Corp.'s total revenues.

In fiscal 1977, the company expects to meet its objectives of computer revenue and profit gains exceeding 10% despite the significant impact of unfavorable foreign currency translation, according to J.J. Ciasullo, vice-president and controller.

Growth plans will be supported "by a continued high level of investment in marketing and research and development and by continued emphasis on computer finance leases over discretionary sales," the firm said.

The R&D budget for computers in fiscal 1977 is about $128 million. During the five years through fiscal 1976, it grew 120% to $470 million and is expected to total about $900 million for the five years starting in fiscal 1978, the firm said.

Product Plans

R.C. Phillips, vice-president of development and manufacturing for the Systems Division, said Univac has made major progress in the past two years in establishing a large-scale integration (LSI) semiconductor facility to design and produce LSI parts for major systems.

In memories, bubble memory work has been stressed and the company expects to ship bubble storage in a small system product within a year.

The company is also working on an advanced development processor, a version of an 1100 series processor, involving custom-developed LSI circuits, he said.

Overall, multiple advanced development processor efforts are under way to meet the needs of the late 1970s and 1980s, the company said.

In looking at Univac product line development, Neil A. Gorchow, vice-president of product strategy and requirements, said current programs include product enhancements which will extend the upper and lower limits of the 1100 series, extend the lower limits of the 90 series and facilitate a move toward unification of the product lines in the 1980s.

The next five years will see significant developments in the areas of software, application programs, communications, data management systems and distributed processing, he said.

The flexibility of a modular processor unit, currently in its newest communications terminals, enables the company to economically span the range of small business systems and distributed processing networks, he added.

The firm is applying the same processor concept to the development of larger scale systems for the 1980s, he noted.

In analyzing Univac's commercial marketing thrust, H.A. Steinberg, executive vice-president of marketing and services, said the installed base for the company's general-purpose computer systems grew 55% worldwide from calendar year 1972 through 1975 compared with an industry growth of 43%.

In 1975, the base grew 17.2% over the previous year compared with 10.9% for the industry itself.

In looking at Univac's recent computer orders, Steinberg said 32% came from new customers. The established customer sales involved both expansion and new computer business with new computers amounting to 43% of the total order mix.

Despite foreign government protection of indigenous suppliers, Univac achieved compound annual growth rates of 23% for revenue and 20% for installed base since fiscal 1974 for the wholly owned operations of the company's Europe/Asia/Africa Division, he said.

Univac remains very interested in foreign joint ventures and would consider any reasonable situation, the firm said.

1968 IBM Study Saw Burroughs Emphasizing Terminals in 1970s

By Molly Upton
Of the CW Staff

NEW YORK – One of Burroughs Corp.'s principal competitive thrusts in the 1970s would be in terminal-based systems, an IBM market evaluation study predicted in 1967.

The report, entered into evidence in the U.S. vs. IBM antitrust trial recently, conceded respect for Burroughs' technical capabilities, observing that its DP products, which addressed almost all classes of the 360, "reflect technical excellence."

The Burroughs product line, it added, "appears to be the strongest product competitor" to the IBM 360/30 and 360/40.

IBM felt Burroughs had devoted too little attention to developing depth and breadth in its field organization, the study indicated. This factor prevented the firm from taking full advantage of its strengths, which IBM said were:

- "A more than satisfactory image.
- A product line which reflected a high degree of technical competence.
- Large representation in smaller businesses.
- A head start in multiprogramming systems.
- Communications/computer expertise developed via government-defense contracts.

IBM Trial Documents

Burroughs' DP revenues in 1966 accounted for 13% of its total revenues, and IBM saw this growing to 16% in 1971. It did not expect Burroughs' growth to exceed 20%/year.

IBM thought Burroughs' principal emphasis would be on the accounting machine market, especially the electronic portion, with efforts in the DP marketplace playing a secondary role.

IBM begrudgingly had respect for Burroughs' nonremovable disk file which, on the one hand, it berated as functionally most comparable to drums but, on the other, admitted that for on-line, real-time environments, the "nonremovable character of [its] disk is not as detrimental as one might initially conclude."

The forthcoming four-station cluster tape drive could prove to be an attractive OEM product, the IBM report observed.

IBM also expected Burroughs would give considerable attention to high reliability, availability and serviceability characteristics since it thought Burroughs would like to lead the market in dedicated communications-based on-line systems, the report indicated.

DP Growth Sharp or Sloping ?

(Continued from Page 43)

equipment that will be available in the next few years," he said. "It is the bread and butter of our industry and not speculation."

These technical drives are rapidly changing the cost of systems for programmers, operators and users, Clayton continued.

The $10,000 floating-point minicomputer system is available hardware-wise today. The $1,000 version of this system is programmed now and should be available by 1980. A system of this type could easily cost no more than $100 by 1983, he maintained.

Returning to software, Clayton said it is the "long-term, real capital investment – both by the manufacturer and the user.

"The hardware wears out in four to five years because the technology moves so rapidly," he stated.

As the cost of hardware goes down and computers find their way into the hands of more and more people, the major challenge facing manufacturers will be to make the intellectual investment on the part of users fit what they spend for these devices, Clayton warned.

People, then, should be the manufacturers' key focus. Ease of use should be the primary cost component of a system and the ultimate goal of its manufacturer.

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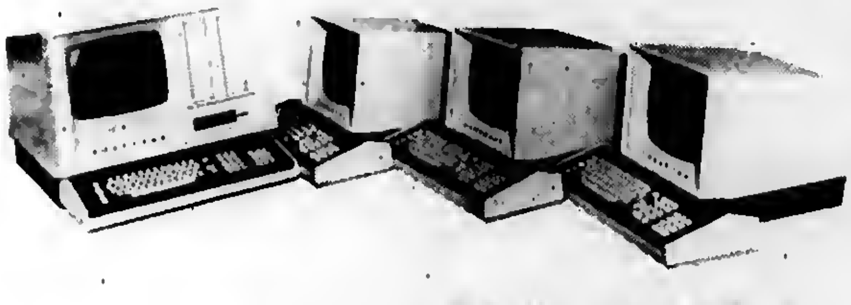

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In Commercial World

HP Forecasts Increasing Usage of APL

By Molly Upton
Of the CW Staff

CUPERTINO, Calif. – With the addition of APL to its 3000-II [CW, Sept. 20], Hewlett-Packard Co. (HP) foresees increasing use of the language in the commercial world, according to Ed McCracken, general manager of HP's General Systems Division.

"In some ways we're predicting a reaction much like the reaction we found when we introduced the first Basic language for small time-sharing systems back in 1968," McCracken said.

"At that time, there were several large service bureaus that were offering terminal time for Fortran and Basic at a very high cost, and that same equivalent position is true today," he said.

"For the first time, APL terminals will be available at a nice, affordable cost," he remarked.

The APL market is in its infancy, and it is one of the languages of the future, he added. "We're really enthusiastic about the increasing use of APL in the commercial world," McCracken said.

"At one time it was strictly a research-oriented language. We think we can expand significantly the use of APL because this is really the first time a really powerful APL has been brought down to a computer this small.

"We think there will be some major advantages to HP because of that," he commented.

Not Easy

"Doing a full extended APL on a system this size isn't particularly easy. It's a very demanding, very high-level language, and in fact we significantly expanded the instruction set of the 3000 to do APL," McCracken noted.

"We have a whole new [read-only memory] block dedicated to special microcoded instructions for APL, which enabled us to increase the execution of certain APL routines by 10 to 20 times."

He explained this does not make the executions that much faster than they would be on a large computer, but "makes response times acceptable on a system this size for an extended APL.

"We've been working on APL for three or four years. At one time we really weren't sure we could get this kind of a good APL on a system this size.

"By using some special techniques that haven't been used before to make a dynamic incremental compiler, we get major increases in response time," he said.

In explaining the relationship between the IBM 5100 and HP's 3000-II, he said, "As desktop computers do compete with time-sharing systems from time to time, there is some competition there."

But, he observed, the HP system supports approximately 12 APL terminals in "pretty hard APL usage."

APL fans, he explained, are totally committed to the language and represent a market in themselves. Their numbers are growing as more people come in contact with the language in universities and continue its usage, he said.

Acquisitions

Altek Corp. has acquired the Computer Equipment Division of Cetec Corp. in a move to expand its computer graphics capabilities.

Delta Electronic Control Corp. has purchased Static Power Co., a manufacturer of uninterruptible power systems, for an undisclosed amount of cash.

Optimum Systems, Inc. has agreed to acquire Computer Congeneric's banking business. Terms of the transaction have not been disclosed.

United Computing Systems, Inc. has agreed to acquire Infonational, Inc., a software and consulting firm, for an undisclosed amount of cash.

Greyhound Computer Corp. has acquired Cybernetics International GmbH, a German leasing company.

HP 3000-II Exceeds Expectations

CUPERTINO, Calif. – While Hewlett-Packard Co.'s (HP) General Systems Division anticipated the order volume for the HP 3000-II would double, the popularity of the Series II has exceeded that expectation, according to Ed McCracken, general manager of the division.

"The 3000-II is doing very well," he said. "We've exceeded all our expectations for order shipments, profits and customer satisfaction."

Delivery times are improving on the large systems, he said, adding the bottleneck in obtaining large disks from ISS-Univac is being solved.

"By the end of the month, we should be in good shape" regarding disk shipments, he said.

With the additional orders, the division has had to expand its customer training "really dramatically, and our lead times there are almost as long as on our systems, and that's a little bit of a problem," he added.

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Dedicated Sales Force 'Reincarnates' System 5000

By Molly Upton
Of the CW Staff

BURLINGTON, Mass. – Having made some of the classical marketing mistakes with its System 5000, Inforex, Inc. has remedied these errors and assigned a dedicated sales force to the system, according to William G. Moore Jr., vice-president of domestic operations.

With the recently upgraded capabilities of the system through the 505 software release (see story on Page 35) and the new marketing approach, Moore indicated the 5000 has been reincarnated.

Initially the 500 file management system was given to the five regional managers, who were told to hire systems engineers and sell it.

But it was difficult to convey the unique capabilities of the system, such as the ability to put up quickly, Moore said. In addition, the system was overpriced and was hard to sell, he added.

In January, Inforex reduced the 5000's price 20% and assigned a dedicated sales force and a product manager to the system.

Jack Hall, product manager, said Inforex took a "situational look" at the market and found the 5000 fits well into three general categories: manual systems upgrade; real-time requirements in a batch environment; and for file management in a time-sharing environment. It can be used as a stand-alone system or as an adjunct to a mainframe, he said.

Moore observed the system is not specialized, and the firm realized its salesmen gravitated to users with certain types of situations which occurred regardless of the specific industry they were in.

Currently 24% of the 5000s installed are in the Federal government, and the firm recently tripled the size of its federal sales force; 14% are in state governments and 24% in manufacturing firms, Moore added.

Focusing on the type of environment the 5000 fits in, Hall explained the manual systems upgrade is that environment where the product operated on is paper, such as tracking correspondence, court dockets and claims processing.

In installations where there is batch capability, the 5000 offers an alternative to an on-line upgrade, he said.

Going on-line can be costly and time consuming and require a high skill level and continued system maintenance; users generally find the system doesn't accomplish the original scope of the project, he said.

The 5000 can be operational within weeks or months, he said.

As part of a subset of the time-sharing market, the 5000 satisfies requirements of file management, he said. For instance, the 5000 offers a given, fixed cost for file access rather than what could be a continually growing cost item, he explained.

William G. Moore Jr.

The 505 release will enlarge the market for the System 5000 both vertically and horizontally, Hall observed.

CW Photos by M. Upton

Jack Hall

Biomedical Market Expected to Reach $6 Billion by '84

By Toni Wiseman
Of the CW Staff

LOS ANGELES – Biomedical instrumentation through the development of more highly sophisticated electronic devices, sensors, monitors and other equipment, is a key to future health care growth, according to Morton D. Schwartz of California State University.

In 1964, the cost of medical equipment used in hospitals was about $600 million, he said. This figure grew to more than $2.5 billion by 1974 and is expected to reach $6.3 billion by 1984.

Over 1,000 companies are currently producing instruments for the health care industry, Schwartz said.

"A new and indispensable partner for the modern health care team has been established in the emerging field of biomedical engineering," Schwartz stated.

"For the first time," he said, "engineers are being trained to develop medical electronic equipment to be used by hospitals and doctors and to assist the medical care team through rapidly successive technological advances."

Current efforts in this emerging field, he said, fall into three categories:

- Bioengineering, which he defined as "the application of engineering concepts and technology to scientific inquiries into biological phenomena for advancing the understanding of biological systems."
- Medical engineering, which uses engineering concepts and technology in the development of instrumentation, diagnostic and therapeutic devices and artificial organs.
- Clinical engineering, which applies engineering concepts, methodology and technology to the improvement of health service delivery systems.

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Scheduled to Go Live Next Year

Air France System for Aeroflot May Be Delayed

By Ivan Berenyi

Special to Computworld

VILGENIS, France – The Soviet airline Aeroflot's Univac-based seat reservations system is likely to be delayed again, according to an Air France spokesman.

"We have already had quite a few delays and it would be optimistic to discount the strong possibility of having more," he admitted.

The contact, signed in mid-1974, gave systems responsibility to Air France after five years of negotiations with numerous parties (including IBM, Univac, Control Data Corp., Air France, Eastern, BOAC/Leasco): Univac will supply the 1106/2 mainframe configuration and Uniscope 100 terminals.

The first delay occurred when the U.S. government took one year to grant an export license for the system, but it has been installed in this southern suburb of Paris since last December.

Further delays have been caused not so much by changing specifications on the part of Aeroflot, but by unexplained visa problems, poor communications between Air France and Aeroflot in Moscow (all exchanges must to be channeled through the appropriate ministries) and the nonarrival of a commercial and operational staff of 50 persons expected for training in Paris since January.

Current indications are that the system will be transported from Paris to Moscow this October, this year, and it is scheduled to go live next February or March.

The Univac hardware has a theoretical capacity of four million to six million passengers per year (PAB) – well within Aeroflot's specifications for international reservations.

The Russians have a locally developed domestic reservations system, Sirena, based on two Minsk-32 processors. Originally intended to become the hub of an extensive network handling bookings on all internal flights (an annual volume of 80 million to 90 million PAB), Sirena currently operates only in the area around Moscow's domestic airport.

There are, however, long-term plans to link Sirena with Aeroflot's 1106-based international system, if only by a telegraphic hookup.

This could aid Aeroflot's ambitions to provide multihost services to the national airlines of fellow Comecon member-countries.

International News

Aeroflot's Univac-based system is modeled closely on Air France's Alpha 3 system, which provides multihost capabilities to several other airlines. Like Alpha 3, it runs under the Air France-developed TOP real-time operating system and includes the multihost option.

However, the growing success of Sita, the Paris-based international data network owned by about 140 airlines, in tendering seat reservations services to East European carriers on its recently purchased Gabriel system must leave Aeroflot's tenancy prospects substantially diminished.

ICL Cutting 16% Of Plant Force

LONDON – International Computers Ltd. (ICL) will be cutting back its manufacturing force by 16%, a cut of 1,400 jobs, over the next 14 months, according to *Computer Weekly* newspaper.

It is the rapid advances made in computer technology and the success of the 2900 series which has led to the staff cutbacks because, as ICL pointed out, the newer generation of machines "requires a much reduced labor content in its manufacture," the British paper said.

Production of the System 4 is being cut 80%, while the Termiprinter is being eliminated altogether.

The 1900 series' production is being cut 46%; production of the 2900s is being stepped up by 50%.

CDP REVIEW

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International News

NTT Sets 1978 Target for Digital Data Net for Japan

TOKYO – Nippon Telegraph and Telephone (NTT) is developing a digital data transmission network in order to meet Japan's swelling demand for data communication services, according to the *EDP/Japan Report* (EDP/JR).

Under Japan's current system, digital signals have to be converted into analog signals before transmission.

Japan lags behind the U.S., Britain, West Germany, France, Canada and Sweden where actual digital network services or tests have been started, according to EDP/JR.

Japan's proposed network is not expected to be in use until March 1978, the report noted.

With the digital network, NTT hopes to reduce connection time to less than one second by employing data terminal equipment using character signals in addition to the dial pulse formula currently used, the report indicated.

This will permit the user to make the outgoing speed of selective signals from the data terminal identical to the data transmission speed.

NTT proposes to increase transmission speed from 50 bit/sec to 48 kbit/sec, according to EDP/JR.

Switching will be done in the form of digital signals within switchboards as well as in the digital data network. This means all pulse code modulation (PCM) pulses can be used as pulses for data signal transmission as a matter of principle, the report said.

In order to improve transmission quality, the PCM formula will be used for almost all transmission channels, resulting in channels highly resistant to noise and distortion; this should result in bit error improvement, the report stated.

Previously unavailable services such as speed change, code conversion, multiple address communication and message multiplex communications are also planned, according to EDP/JR.

In addition, the system will provide a combination of closed leased circuits similar to intracompany data communication systems to provide confidentiality, the report said.

Control System For USSR Region In the Works

Novosti Press Agency

Special to Computerworld

TOMSK, Siberia – The first stage of the automated control system (ACS) for managing the economy of the Tomsk region has been put into operation here.

This is the basic element of the countrywide automated system of collecting and processing information for the accounting, planning and management of the national economy.

In Tomsk, the ACS is seen as a means of running a social system rather than a purely economic and production project. Therefore, in this job humanities are as important as mathematics or engineering.

The organization of the ACS has made it possible to understand the relationship of the controversial combination of the interests of territorial complexes and the national economy as a whole.

The Tomsk specialists tried to determine the problem situation. "We understand it as a gap between the actual state of affairs and what is desired, both today and tomorrow," they said.

In the process of designing the ACS in the Tomsk region, three main stages appeared. In the beginning, the main task is to collect information about the system as a whole so every element of the control system, be it in Tomsk, Novosibirsk, or Moscow, can have complete information about the situation in the region.

This task can be accomplished successfully with the help of an automated system of master data banks on production, the population and the environment. The plan is to use those banks for storing information about the past and current state of affairs as well as the norms.

In its second stage, the ACS is used to specify functions in the management of the region.

The third stage is the drawing of comprehensive development programs aimed at the eradication of the existing and possible situations.

The Tomsk specialists attach much importance to centralization, that is, the pooling of all the services of the ACS in a single computer center.

This tangibly reduces the costs of control and management, raises the efficiency of the management system and makes it possible to release personnel to be used elsewhere.

The building for the future Tomsk integrated computer center already has been blueprinted and the comprehensive development program has been computerized.

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"First, I would like to commend Mr. Stimler, who is a rare individual, with a great deal of knowledge of experience, who can impart his knowledge in very clear and precise language. This seminar has reminded me that very complicated situations can be broken down to manageable and understandable parts. I feel that with this beginning, I can proceed to begin to measure and evaluate our computer system."

J.F. McHenry, Manager, Computer Operations
Continental Can Co., New York, N.Y.

Saul Stimler is the Seminar Leader

Saul Stimler is President of Stimler Associates. He is a 16-year veteran in data communications and data processing. He has provided in-house training, specification preparation, design, evaluation, performance improvement, system planning, benchmarking and project management consulting services for leading companies and government agencies in the United States and Canada. Mr. Stimler is the author of the highly acclaimed book, *Data Processing Systems - Their performance, evaluation, measurement and improvement*, and this book will be an important part of the course materials. Advance copies are available - see the coupon below.

Charges and Enrollment

The charge for the entire 2-day seminar, including continental breakfast, luncheons, and all course materials is only $250 per registrant. This does not include hotel rooms, if necessary, but we have reserved space at the seminar hotels for attendees who wish them.

To enroll, look over the schedule below, fill in the coupon and send it in. Remember, enrollment is limited and no space can be firmly held until we have received check or purchase order.

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Like Course 1010, this seminar will focus on recent developments in data communications. But Course 1020 will concentrate on greater depth and detail. It assumes that attendees are already involved with and experienced in data communications networks, and that they desire very detailed knowledge in the field. Emphasis will be placed on thoroughly examining contemporary cost-reduction networking ideas, along with specific procedures for implementing them. Design problems associated with terminal selection and line organization will be addressed in detail as they apply to recent developments like SDLC, satellite transmission and integrated multiapplication nets. Algorithims for determining line speeds, number of ports the optimum mix of WATS and DDD for switched nets will also be examined. This seminar will give you the ability to perform your own design calculations, and it will enable you to recognize areas in present (or proposed) systems where cost savings are possible. And you will gain practical mastery of the techniques you need to realize these savings.

Dr. Dixon R. Doll is the Seminar Leader

Dixon R. Doll received his B.S. degree in Electrical Engineering (Cum Laude) from Kansas State University, and as a National Science Foundation Scholar he received his M.S.E. in Electrical Engineering and PhD in Systems Engineering from the University of Michigan. Dr. Doll has extensive experience with equipment vendors and users. He is the principal architect of the Communications Network Configurator, a family of computer programs used by the Raytheon Data Systems Company to design and analyze end-user computer-communications networks. As Head of DMW Telecommunications Corporation, which he founded, he designed Household Finance Corporation's North American Orbit network, involving more than 2700 terminals and 10 concentrators throughout the U.S. and Canada. He has developed teleprocessing network analysis software for many other major organizations, including Burroughs Corporation, IT&T, MCI, Proctor & Gamble, Sun Oil, Texas Instruments and VWR Scientific Corporation. He is also a visiting staff member at the IBM Research Systems Institute in New York, where he teaches courses on data communications fundamentals, teleprocessing network design and resource sharing computer networks. Dr. Doll, a founder and Technical Director of the International Communications Corporation's ICC Institute in Miami, will lead the entire seminar.

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The charge for Course 1010, a two-day seminar, is $350 per registrant, and $300 for additional registrants from the same company. The charge for Course 1020, a three-day seminar, is $450 per registrant, and $400 for each additional registrant from the same company. Both seminars include continental breakfasts, luncheons and all course materials at no extra charge. Hotel rooms, if necessary, are not included, but we have reserved space at the seminar hotels for attendees who wish them.

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Requirements are minimum of 2 years accredited college or technical study and 3 years applications programming experience, or an equivalent combination of education, experience and training. B.S. degree preferred.

TOTAL, DOS, ALC, on-line, municipal gov't experience preferred.

Salary Range is $13,029.12 to $16,628.97. Starting salary depends on qualifications. Send resume to:

Bruce A. Larkin
Assistant Personnel Director
Civil Service Department
P.O. Drawer 14250
Fort Lauderdale, Florida 33302.

IMS APPLICATIONS ANALYST

2 years experience on IMS applications with teleprocessing using Cobol. Must be familiar with OS, JCL on large scale IBM. Salary 15K to 22K, depending upon experience. In South Florida. Call (305) 358-9280 or send resume to Michael Rottblatt, Ott, Hertner, Ott and Associates, 1401 Brickell Ave., Miami, Florida 33131.

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or William Bond
Romac & Associates
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(404) 256-0433

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B-6700

Systems Programmer

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South & Southwest: Atlanta (404/634-5127), Dallas (214/638-4080), Fort Worth (817/338-9300), Houston (713/626-8705), New Orleans (504/523-2576).
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Terminal Systems Division - Cambridge
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Phone: (614) 439-0398

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We're looking for a creative individual with three to five years experience working with the UNIVAC 1100 Operating System on UNIVAC 1100 Series mainframe and peripheral hardware.

As part of our Operating System group, you'll be involved in system generation, Operating System testing, and trouble shooting. Projects in computer performance evaluation, benchmark construction, and computer sizing are other challenging aspects of this group's responsibility.

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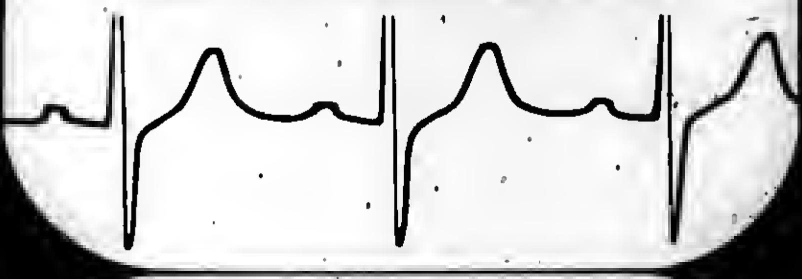

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SYSTEMS ANALYST/ PROGRAMMER – IBM SYSTEMS 3

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Please submit resume, including salary history, to E. Connelly, UNITED BRANDS, Prudential Center, Boston, Mass. 02199, or call 262-3000, ext. 419 for further information.

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Duties include dealing with instructional and research faculty of a large, diverse University on computing activities and needs ranging from special purpose laboratory mini-computers to large scale batch and interactive computing. This Associate Director will work closely with the Director and the Associate Director for Technical Computing and six departmental managers toward planning, developing, and implementing computing support functions for undergraduate and graduate instruction and academic research programs. Will manage personnel. Qualifications sought in applicants for this position include the following: Ph.D. essential, preferably in Computer Science or related field; some academic teaching and/or research experience plus current experience in a medium to large scale higher education or research computing center; desire experience in middle or upper management of a computing center; professional knowledge of state-of-the-art of academic computing technologies such as interactive timesharing, graphics, CAI.

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Duties include dealing with technical support personnel (software and hardware) of the Computing Center, vendors of hardware and software systems, as well as faculty and staff of the University. This Associate Director will work closely with the Director, Associate Director for Academic Computing and six departmental managers toward planning, developing, and implementing computing support functions for academic, research, and administrative activities of the University. Will manage personnel. Qualifications sought in applicants for this position include the following: M.S. or Ph.D., preferably in Computer Science or related field; in-depth technical experience with medium to large scale IBM systems, both hardware and system control software; experience in middle or upper management of a computing center; professional knowledge of the state-of-the-art in IBM systems such as MVS, VM, CMS/APL, IMS and SNA.

Both of these Associate Directors will report to the Director of the Computing Center and will together form the senior management team to lead a complex and sophisticated leading-edge University Computing Center. Either position can provide for a limited amount of instruction and/or research activity if so desired. Presently, the Computing Center has approximately 75 employees. The hardware consists of two 3 megabyte S/370 model 158's (one model III), 3350 disk units, a 3705 with a large communications network. The software systems include MVS, VM, IMS and VM/CMS.

Salary for both positions is open and commensurate with selected candidates' qualifications and experience. Reply in confidence with resume' and salary expectations to:

Mr. O.L. Gibson, Jr., Director
VPI & SU Computing Center.
126 Burruss Hall
Blacksburg, Virginia 24061
(703) 951-6381

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Provide leadership and direction for academic services group. Plan & develop all support svcs., coordinate & supervise consulting svcs., & technical activities, & plan & manage software/hardware support.

Must be familiar w/ IBM 370/168, DEC 10, DCE 3200 & Burroughs 5500. Requires MS in Eng. or Science or equivalent academic svcs. experience. Salary 14-16.5K.

Benefits including BC/BS, life ins., pension plan, vac. & sick leave & free tuition for self & dependents.

Send resume & salary history to: Dir. of Personnel, Drexel Univ., 32nd & Chestnut Sts., Phila., PA 19104. *EEO Employer.*

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We are seeking degreed individuals with several years experience in COBOL programming and systems analysis. Sound knowledge of manufacturing business systems helpful. Previous experience with DOS and DBOMP or OS and IMS preferred.

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As a result of enpanding development on our IBM 370's, we have several positions available for Operating Systems programmers. To qualify, you MUST have experience in either the CP or the CMS components of VM/370; or CP/67-CMS.

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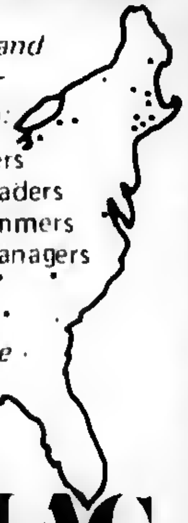

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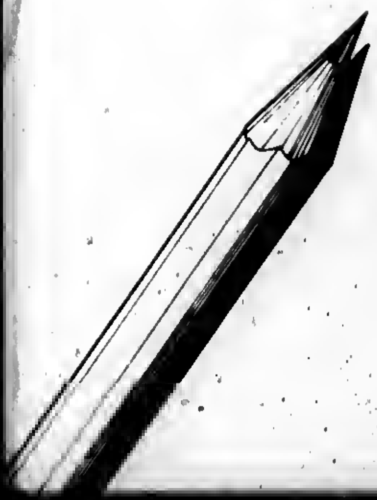

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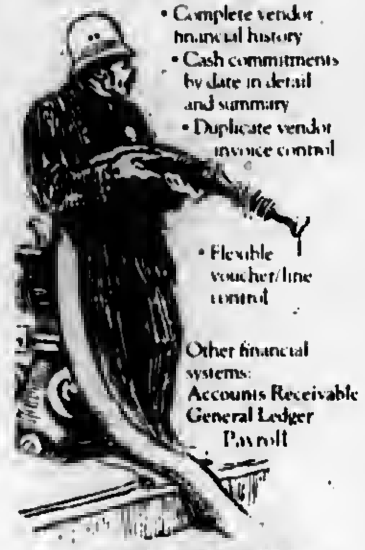

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Despite Fourth-Quarter Rise

DPF Shows Earnings Decrease for Year

HARTSDALE, N.Y. – DPF, Inc. showed a decrease in earnings for the year ended May 31, but an increase for the fourth quarter compared with year-ago figures.

However, the firm's operating income dropped in the year and showed a loss for the fourth quarter.

Infusion From IBC

Much of the company's bottom line in both periods reflected the infusion of the firm's equity in earnings of Interstate Brands Corp. (IBC), acquired during the year.

DPF indicated it will no longer apply the break-even accounting basis with respect to its IBM 360 leasing operations.

The company expects to report profits from this area in the first quarter of fiscal 1977, it said. DPF has reported results from its 360 base on a break-even accounting basis since June 1, 1971.

During the year, the firm acquired 49.5% of the outstanding common stock of IBC, a large wholesale baking company, with funds generated internally from its 360 portfolio, Chairman Bertram J. Cohn said.

Bought 370s

DPF also acquired 370s worth about $27 million for its own account, he added.

For the year, revenues dropped to $22.8 million compared with $25.5 million last year.

Earnings for 1976, including $1.4 million from IBC and a tax credit of $30,000, totaled $1.9 million or 47 cents a share.

This compares with 1975 earnings of nearly $4.9 million or $1.19 a share, including a $2.3 million tax credit and a $2.2 million gain on repurchase of debentures.

Operating Income

For the year, operating income fell to $217,000 compared with $379,000; during the quarter, the firm showed an operating loss of $290,000 compared with income of $161,000 in the year-ago period.

During the quarter, earnings rose to $360,000 or 9 cents a share compared with $263,000 or 6 cents a share in the year-ago period, when there was a $104,000 tax credit.

Revenues for the quarter rose slightly to nearly $5.5 million compared with $5.4 million in the same period last year.

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Decision Data Dips in Six Months

HORSHAM, Pa. – Decision Data Computer Corp. suffered a loss in the first half of the year despite a healthy second quarter.

Earnings for the quarter were $29,000 or 1 cent a share compared with a loss of $31,000, offset by a $99,000 tax credit in the year-ago quarter.

Revenues Dropped

Revenue for the quarter was $9.09 million, down from $11.2 million in 1975.

In the six months, the firm lost $592,000 compared with earnings of $493,000 or 13 cents a share, including a $261,000 tax credit, in the year-ago period.

Revenue for the first six months declined to $16.8 million compared with $22.8 million in the comparable year-ago period.

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MCS Reports Records In First Six Months

ELMSFORD, N.Y. – Mini-Computer Systems, Inc. (MCS) reported record sales and earnings for the first six months.

Revenues for the period ended April 30 totaled $3.6 million compared with $2 million for the same year-ago period.

Earnings rose to $337,000 or 51 cents a share compared with $272,000 or 44 cents a share in the year-ago period when there was a $95,000 credit.

AMS Net Doubles In Nine Months

SUNNYVALE, Calif. – Advanced Memory Systems, Inc.'s (AMS) earnings for the first nine months more than doubled with the help of a $1.2 million tax credit.

Earnings for the quarter ended June 25 were $787,000 or 30 cents a share compared with $665,000 or 26 cents a share, including a $316,000 tax credit, in the third quarter of 1975.

Revenue for the quarter rose to $9.7 million compared with $8 million in the year-ago period.

Nine-month earnings were $3.3 million or $1.27 a share, including the $1.2 million tax credit, compared with $1.4 million or 56 cents a share in the comparable 1975 period, which benefited from a $676,000 tax credit.

Revenue for the first nine months increased to $29.3 million compared with $23.2 million a year ago.

New Registrations

ADVANCED MEMORY SYSTEMS, INC., 1275 Hammarwood Ave., Sunnyvale, Calif. 94086, a semiconductor manufacturer, filed to register 2,783,955 shares of common stock to be issued in conjunction with the merger of Intersil, Inc. with Advanced Memory Systems, Inc.

DATA RESOURCES, INC., 29 Hartwell Ave., Lexington, Mass. 02173, a firm providing computer-accessible economic data banks and econometric models and forecasts, filed to register 371,320 shares of common stock, of which 132,500 shares are to be sold by the company and the remainder by certain stockholders. The underwriter is William Blair & Co., 135 S. LaSalle St., Chicago, Ill. 60603.

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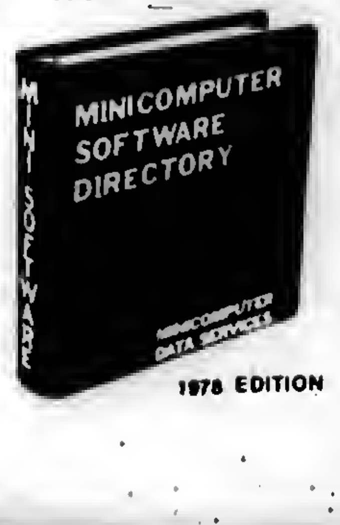

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Sycor Revises 1976 Outlook

ANN ARBOR, Mich. – Sycor, Inc. has revised downward its projections for revenues and earnings for the year, reflecting an expected decrease in the level of foreign revenues.

President Samuel N. Irwin indicated domestic business is excellent and the company has accelerated the rate of its investment in the domestic sales force and in product development.

However, "although the Olivetti relationship continues to be excellent, Sycor has reduced its projections of shipments to Olivetti for the remainder of the year," Irwin explained.

"Uncertainties with regard to November and December shipping schedules remain and appear to relate primarily to trade restrictions causing a disruption of Olivetti sales in South America and to year-end inventory planning throughout the Olivetti organization," he said.

Quarter Increase Marks AJ Trend

SUNNYVALE, Calif. – Anderson Jacobson, Inc.'s (AJ) results for the first quarter showed a continuing trend of increasing revenue and earnings.

Earnings for the quarter ended June 30 reached $234,181 or 10 cents a share compared with $194,572 or 8 cents a share in the year-ago quarter.

Revenue for the quarter was $4.7 million compared with $4 million a year ago.

"The problems that caused the reduced order input [in previous quarters] have been corrected for the most part. The sales department is now back to full strength," according to Raymond E. Jacobson, AJ president.

"Our new keyboard-printer terminal, the AJ 832, is now coming off the production line in sufficient quantity," he said.

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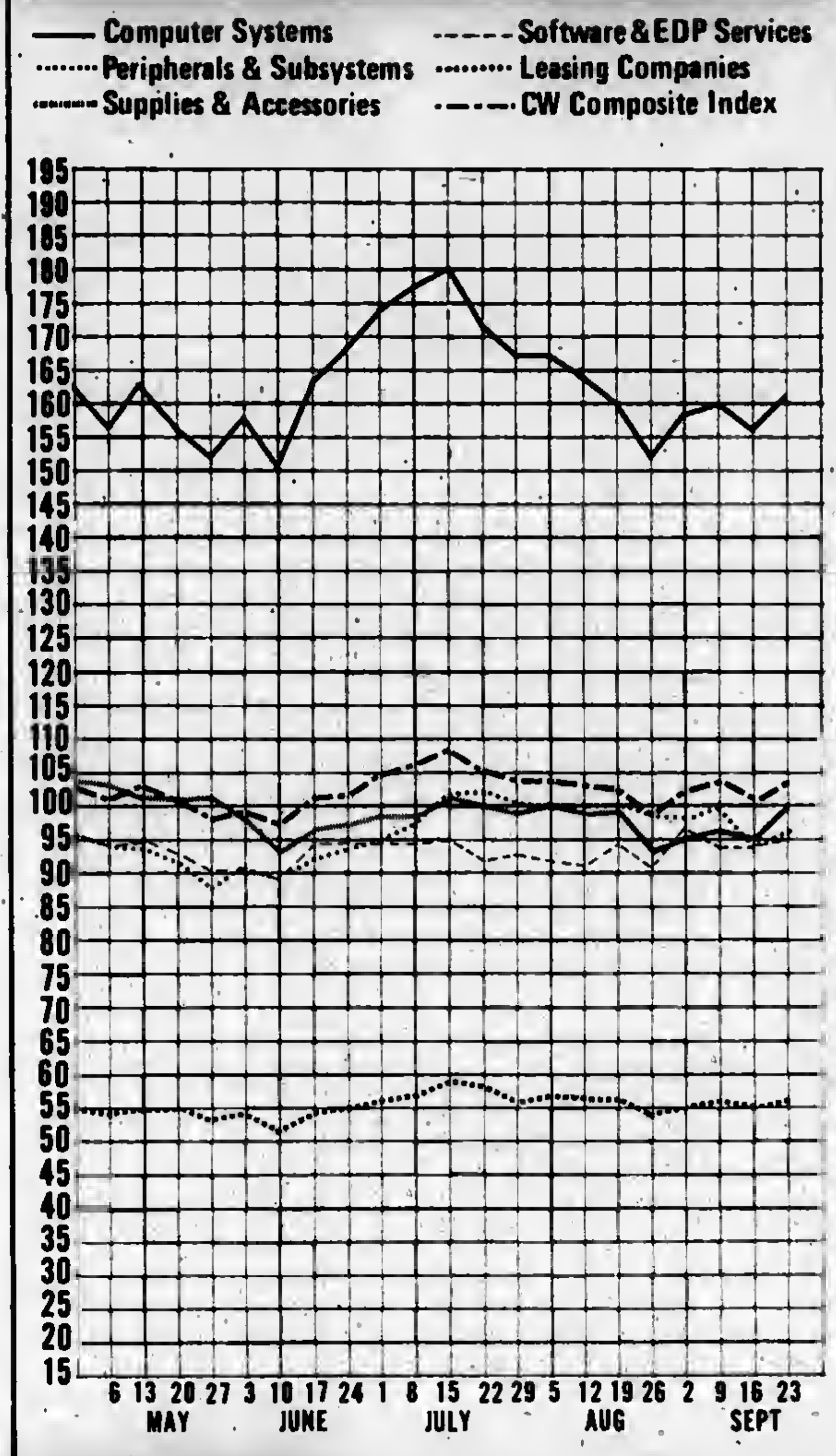

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Earnings	5,504,000	3,613,000
6 Mo Shr	.99	a.71
Revenue	96,108,000	61,866,000
Earnings	10,507,000	7,305,000

a-Adjusted for a 50% stock dividend paid in May 1976.

MEMOREX

Three Months Ended June 30

	1976	1975
Shr Ernd	$1.58	$1.29
Revenue	80,839,000	65,620,000
aSpec Cred	3,132,000	4,881,000
Earnings	9,156,000	6,216,000
6 Mo Shr	3.18	1.62
Revenue	160,258,000	127,245,000
aSpec Cred	6,926,000	5,456,000
Earnings	18,239,000	7,799,000

a-Consists of gains from tax-loss carry-forwards and sale of debentures.

SYCOR

Three Months Ended June 27

	1976	1975
Shr Ernd	$.45	$.48
Revenue	17,296,000	13,116,000
Tax Cred	.....	285,000
Earnings	1,545,000	1,357,000
6 Mo Shr	.87	.92
Revenue	33,090,000	24,312,000
Tax Cred	.....	666,000
Earnings	2,783,000	2,573,000

MOHAWK DATA SCIENCES

Year Ended April 30

	1976 (000)	b1975 (000)
Shr Ernd	$1.92	.....
Revenue	161,672	$170,109
Disc Op	.....	(668)
aSpec Cred	11,455	.....
Earnings	13,560	d(21,677)
3 Mo Share	1.28	.....
Revenue	41,026	44,512
aSpec Cred	9,418	.....
Earnings	10,178	d(11,457)

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, SEPTEMBER 22, 1976

All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		1976 RANGE (1)	CLOSE SEP 22 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	84-108	95 1/2	+4 1/2	+4.9
C	COMPUTER AUTOMATION	10- 19	17 5/8	+1 5/8	+10.1
N	CONTROL DATA CORP	18- 27	23 7/8	+ 5/8	+2.6
N	DATA GENERAL CORP	40- 60	47 1/4	+2 1/4	+5.0
O	DATAPOINT CORP	24- 46	31 1/4	-3 1/2	-10.0
O	DIGITAL COMP CONTROL	2- 7	6 5/8	+ 3/4	+12.7
N	DIGITAL EQUIPMENT	130-181	162 3/4	+3 3/4	+2.3
N	ELECTRONIC ASSOC.	2- 5	2 5/8	0	0.0
A	ELECTRONIC ENGINEER.	7- 16	9 3/4	+ 1/2	+5.4
N	FOXBORO	28- 50	49	+4 1/4	+9.4
O	GENERAL AUTOMATION	5- 11	5 3/4	- 1/2	-8.0
C	GRI COMPUTER CORP	1- 1	7/8	+ 1/8	+16.6
N	HEWLETT-PACKARD CO	85-117	95	+4 1/8	+4.5
N	HONEYWELL INC	34- 56	47 3/4	+3 1/4	+7.3
N	IBM	227-288	285 1/2	+7 1/4	+2.6
O	MANAGEMENT ASSIST.	1- 3	1 5/8	-	-3.7
O	MEMOREX	18- 33	22 3/4	+2	+9.6
O	MICRODATA CORP	10- 28	27	+ 3/4	+2.8
C	MODULAR COMPUTER SYS	4- 14	4 1/4	+ 3/4	+21.4
N	NCR	24- 37	36 7/8	+1 1/4	+3.5
C	PRIME COMPUTER INC	4- 14	12 1/4	- 3/4	-5.7
N	PERKIN-ELMER	19- 27	22 7/8	+ 1/8	+0.5
N	RAYTHEON CO	45- 67	66 3/4	+4	+6.3
N	SPERRY RAND	40- 52	49 3/4	+2 3/4	+5.8
O	SYCOR INC	13- 31	13 3/4	-6 1/2	-32.0
A	SYSTEMS ENG. LABS	6- 10	6 7/8	0	0.0
N	VARIAN ASSOCIATES	13- 17	14 1/2	+ 5/8	+4.5
A	WANG LABS.	11- 20	16 5/8	- 1/8	-0.7

LEASING COMPANIES

EXCH		1976 RANGE (1)	CLOSE SEP 22 1976	WEEK NET CHNGE	WEEK PCT CHNGE
C	COMDISCO INC	3- 10	7 1/2	0	0.0
A	COMMERCE GROUP CORP	2- 3	2 1/8	+ 1/8	+6.2
A	COMPUTER INVSTRS GRP	1- 3	1 3/4	+ 1/8	+7.6
M	DATRONIC RENTAL	0- 1	7/8	0	0.0
A	DCL INC	1- 1	5/8	0	0.0
N	DPF INC	5- 8	7 1/8	+ 1/8	+1.7
N	ITEL	6- 15	13 1/4	+ 1/2	+3.9
N	LEASCO CORP	6- 19	17	0	0.0
O	LEASPAC CORP	0- 1	1/4	0	0.0
O	NRG INC	0- 1	3/8	0	0.0
A	PIONEER TEX CORP	6- 9	7 1/4	0	0.0
N	U.S. LEASING	7- 12	9 3/4	+ 1/2	+5.4

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

SOFTWARE & EDP SERVICES

EXCH		1976 RANGE (1)	CLOSE SEP 22 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 3	1 3/4	+ 1/8	+7.6
C	ANACOMP INC	6- 11	7 3/8	+ 1/2	+7.2
A	APPLIED DATA RES.	2- 4	4	+ 3/4	+23.0
N	AUTOMATIC DATA PROC	17- 35	32	+ 7/8	+2.8
C	COLEMAN AMERICAN COS	2- 6	2 1/2	0	0.0
O	COMPUTER DIMENSIONS	3- 7	5 1/4	0	0.0
O	COMP ELECTION SYSTMS	5- 9	6	- 3/4	-11.1
C	COMPUTER HORIZONS	1- 2	1 1/4	- 1/4	-16.6
C	COMPUTER NETWORK	2- 6	5 1/4	+ 7/8	+20.0
N	COMPUTER SCIENCES	4- 8	6 3/8	+ 1/8	+2.0
O	COMPUTER TASK GROUP.	1- 1	1	0	0.0
C	COMPUTER USAGE	3- 6	3	0	0.0
C	COMSHARE	2- 9	5 1/4	0	0.0
O	DATA DIMENSIONS INC	2- 4	2 5/8	0	0.0
C	DATATAB	1- 1	1 3/8	0	0.0
N	ELECTRONIC DATA SYS.	12- 18	15 1/2	- 1/8	-0.7
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	INSYTE CORP	1- 3	1 5/8	- 1/8	-7.1
C	IPS COMPUTER MARKET.	1- 2	1 1/8	0	0.0
O	KEANE ASSOCIATES	2- 4	2 1/4	0	0.0
C	KEYDATA CORP	2- 5	1 5/8	- 1/4	-13.3
C	LOGICON	3- 4	3 3/8	0	0.0
A	MANAGEMENT DATA	1- 3	2 3/4	+ 3/4	+37.5
A	NATIONAL CSS INC	13- 25	21 1/8	0	0.0
A	ON LINE SYSTEMS INC	18- 22	20	0	0.0
N	PLANNING RESEARCH	3- 5	4	+ 3/8	+10.3
C	PROGRAMMING & SYS	1- 1	3/8	0	0.0
O	RAPIDATA INC	2- 5	2 1/8	0	0.0
C	REYNOLDS & REYNOLDS	13- 21	14 3/4	- 1/4	-1.6
C	SCIENTIFIC COMPUTERS	1- 1	1	0	0.0
O	TYMSHARE INC	17- 28	17 1/4	-8 1/4	-32.3
A	UPS SYSTEMS	3- 5	3 7/8	+ 3/8	+10.7
N	WYLY CORP	2- 7	1 3/4	+ 1/8	+7.6

PERIPHERALS & SUBSYSTEMS

EXCH		1976 RANGE (1)	CLOSE SEP 22 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	8- 13	10 5/8	+1 3/4	+19.7
O	ADVANCED MEMORY SYS	4- 10	6 5/8	+ 1/4	+3.9
N	AMPEX CORP	5- 10	7 1/2	+ 1/2	+7.1
C	ANDERSON JACOBSON	2- 4	2 7/8	- 1/8	-4.1
C	APPLIED DIG DATA SYS	13- 25	19 3/4	+1	+5.3
O	BEEHIVE MEDICAL ELEC	3- 9	9	+ 1/4	+2.8
A	BOLT.BERANEK & NEW	7- 11	8 5/8	+ 5/8	+7.8
N	BUNKER-RAMO	5- 10	7 3/4	- 1/8	-1.5
A	CALCOMP	4- 7	4 1/2	+ 1/4	+5.8
O	CAMBRIDGE MEMORIES	0- 6	3/8	- 1/8	-25.0
N	CENTRONICS DATA COMP	20- 36	34 1/2	+ 1/4	+0.7
C	CODEX CORP	22- 42	35	-1	-2.7
O	COGNITRONICS	1- 1	7/8	0	0.0
C	COMPUTER COMMUN.	1- 6	6 1/2	+ 3/4	+13.0
C	COMPUTER CONSOLES	4- 7	4 1/2	- 1/2	-10.0
A	COMPUTER EQUIPMENT.	1- 3	1 3/4	0	0.0
C	COMPUTER TRANSCEIVER	1- 3	1	+ 1/8	+14.2
O	COMTEN	4- 9	8 1/2	+ 1/4	+3.0
N	CONRAC CORP	20- 25	22 7/8	+1 1/4	+5.7
O	DATA ACCESS SYSTEMS	1- 4	4 3/4	+ 1/2	+11.7
O	DATA 100	7- 13	9 1/2	+ 1/8	+1.4
A	DATA PRODUCTS CORP	5- 15	12 5/8	+ 1/4	+2.0
O	DATA TECHNOLOGY	1- 2	1 5/8	+ 1/8	+8.3
O	DATUM INC	1- 2	1 3/8	0	0.0
O	DECISION DATA COMPUT	1- 4	1 1/4	- 1/4	-16.6
O	DELTA DATA SYSTEMS	1- 1	3/4	- 1/4	-25.0
N	ELECTRONIC M & M	1- 4	3 1/2	+ 3/8	+12.0
O	FABRI-TEK	1- 1	5/8	- 1/8	-16.6
O	GENERAL COMPUTER SYS	1- 2	1	0	0.0
N	HAZELTINE CORP	4- 12	8 3/4	+ 1/4	+2.9
N	HARRIS CORP	34- 55	52 1/2	- 3/4	-1.4
A	INCOTERM CORP	9- 20	11 5/8	+ 1/4	+2.1
C	INFOREX INC	3- 7	5	+1 1/8	+29.0
C	INFORMATION INTL INC	10- 18	12 1/8	+ 5/8	+5.4
O	INTEL CORP	59-109	63	-2	-3.0
A	LUNDY ELECTRONICS	3- 7	3 3/4	+ 1/2	+15.3
O	MSI DATA CORP	3- 7	5 7/8	- 1/8	-2.0
A	MILGO ELECTRONICS	15- 21	18	+1 3/8	+8.2
N	MOHAWK DATA SCI	3- 10	7 3/4	+ 7/8	+12.7
O	PENRIL CORP	1- 3	2	0	0.0
A	PERTEC CORP	3- 0	7 1/8	+ 1/4	+3.6
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
C	PRECISION INST.	4- 10	3	-1	-25.0
C	QUANTOR CORP	4- 6	4 1/8	0	0.0
O	RECOGNITION EQUIP	6- 11	9 1/4	+1 3/4	+23.3
N	SANDERS ASSOCIATES	6- 11	9 1/2	+ 3/4	+8.5
O	SCAN DATA	2- 4	1 7/8	0	0.0
C	STORAGE TECHNOLOGY	9- 13	11 7/8	+ 5/8	+5.5
C	T BAR INC	5- 10	5 7/8	0	0.0
O	TALLY CORP.	4- 6	4 1/4	0	0.0
O	TEC INC	3- 6	5 3/4	+ 1/2	+9.5
N	TEKTRONIX INC	45- 67	67	+5 3/4	+9.3
N	TELEX	2- 5	3	0	0.0
C	WANGCO INC	11- 22	21 1/8	0	0.0
O	WILTEK INC	2- 2	1 3/4	- 3/8	-17.6

SUPPLIES & ACCESSORIES

EXCH		1976 RANGE (1)	CLOSE SEP 22 1976	WEEK NET CHNGE	WEEK PCT CHNGE
C	ADVANCED SYSTEMS INC	1- 4	3 1/4	0	0.0
O	BALTIMORE BUS FORMS	3- 5	3	+ 1/2	+20.0
A	BARRY WRIGHT	6- 10	9 1/8	+1 5/8	+21.6
C	CYBERMATICS INC	1- 1	1/2	0	0.0
A	DATA DOCUMENTS	25- 42	30 7/8	- 1/8	-0.4
C	DUPLEX PRODUCTS INC	13- 24	13 1/2	- 1/8	-0.9
N	ENNIS BUS. FORMS	6- 8	6 1/4	0	0.0
O	GRAHAM MAGNETICS	8- 13	10 1/2	+1 1/4	+13.5
O	GRAPHIC CONTROLS	13- 19	16 3/4	+1 3/4	+11.6
N	3M COMPANY	53- 66	66 1/8	+3 3/8	+5.3
C	MOORE CORP LTD	35- 51	35 1/4	- 1/2	-1.3
N	NASHUA CORP	11- 18	17 3/4	+1 1/4	+7.5
O	STANDARD REGISTER	15- 19	16 1/4	+ 1/2	+3.1
C	TAB PRODUCTS CO	5- 11	10 1/4	0	0.0
N	UARCO	20- 25	20 1/8	+ 1/4	+1.2
A	WABASH MAGNETICS	4- 8	7 1/4	+ 1/8	+1.7
N	WALLACE BUS FORMS	19- 25	22 3/8	+1 3/8	+6.5

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NEWSPAPER

CW Photo by E. Surden

North of the Border

Visitors at the Canadian Computer Show and Conference in Montreal last week stopped in at more than 100 exhibits representing a cross-section of products and services. See story on Page 2.

Calcomp vs. IBM Antitrust Trial Expected to Bring Quick Verdict

By Molly Upton
Of the CW Staff

LOS ANGELES – While any decision in the U.S. vs. IBM antitrust trial is seemingly years away, industry observers believe the California Computer Products, Inc. (Calcomp) vs. IBM antitrust trial will produce a more expeditious verdict.

The trial, scheduled to start here Nov. 8, is expected by presiding Judge Ray McNichols to last about six months.

Although this figure is somewhat longer than McNichols' original estimate of four months and thus pushes back the pending trial of Memorex vs. IBM, the Calcomp trial is almost certain to end sooner than the New York proceeding.

Calcomp is asking for a jury trial, whereas IBM's bout with the Justice Department is being heard by Judge David N. Edelstein without a jury.

Charges being pressed by Calcomp include antitrust violations in three market areas: general-purpose computer systems; disk files regardless of which maker's system they fit; and disk files on IBM equipment.

Calcomp Chairman Lester L. Kilpatrick said Calcomp intends to take one month to present a case similar to that of the Justice Department. The firm intends to use the best documents it can find, in-

(Continued on Page 2)

Witnesses Hit Reform Act As Bell Grab for Monopoly

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – The Consumer Communications Reform Act of 1976 "is an unprecedented grab for monopoly power over a critically important industry," Kenneth Cox, senior vice-president of MCI Communications Corp., said here last week.

With this statement, Cox, a former commissioner of the Federal Communications Commission (FCC), set the tone for the second day of hearings on the proposed Reform Act conducted by the House Subcommittee on Communications.

Cox called the proposed law "misleadingly titled" and said it "asks Congress to make findings which are contrary to fact."

Although the telephone industry claims the Bell-fostered bill is not anticompetitive, the whole objective of the proposal would fail if it did not eliminate competition in both the terminal and specialized communications areas, he said.

"The most constructive thing your subcommittee could do would be to make a finding that this legislative proposal is without merit and should not receive further attention," Cox said.

"This is not a bona fide dispute over the allocation of authority in our federal system. Rather, it is just one more instance of dishonesty on the part of supporters of this legislation in their effort to override the FCC's decisions opening up telecommunications to limited competition so telephone companies can enjoy a total monopoly over this country's communications," he said.

Representing the specialized carriers, C. Gus Grant, president of Southern Pacific Communications and President of the Ad Hoc Committee for Competitive Telecommunications (ACCT), told the subcommittee AT&T's concerns about the present threat of competition from the specialized carriers "are absurd."

AT&T's chairman last week called for an immediate moratorium on competitive experiments of the FCC. For this and other views supporting the Consumer Communications Reform Act, see Page 6.

The carriers competing with Bell have captured "the gargantuan level of one-half of 1%" of the market. It is hard to see how this could be a threat to consumers, the independent telephone companies or the Bell system, Grant said.

Total revenues of the specialized carriers grew from $7 million in 1974 to $43 million in 1975, an increase of $36 million. During this same period, Bell's revenues grew from $940 million to over $1

(Continued on Page 4)

To Offset Effects of Embargos

Test of Oil Crisis Tactics Starts Today

By Edith Holmes
Of the CW Staff

PARIS – Nineteen industrial nations and more than 30 oil companies are beginning a computer simulation here today to test strategies that could counter an oil emergency of the future.

Coincidentally, today is also the third anniversary of the start of the Yom Kippur War which sparked a severe worldwide oil shortage in 1973-74.

As part of its energy games, the International Energy Agency (IEA) members will divert petroleum shipments to countries imagined to be short of oil on a Burroughs Corp. B6700, B4700 and an extensive telecommunications system at an Organization for Economic Cooperation and Development (OECD) installation here, according to an IEA spokesman.

The test will be conducted for six to eight weeks under the direction of the IEA. This agency was created by 19 oil-consuming countries following the 1973 war and the ensuing embargo on petroleum shipments to the U.S. and The Netherlands by most Arab states.

In addition to the U.S., IEA members include Canada, Britain, France, West Germany and Japan.

As of last week, the IEA anticipated 32 oil companies, responsible for moving 80% to 90% of the petroleum exchanged in international commerce, would participate in the simulation.

"Participation" by these companies is crucial, and with U.S. and IEA supervision, they have done most of the planning for this test, the IEA said.

Officials in Washington, D.C. and in other capitals agreed the major oil companies would have to carry the burden of managing supplies as they did in 1973-74 if another oil crisis occurs. Nearly half of the participating companies are American.

One new factor has been added to these games that didn't exist during the embargo three years ago: Congress has authorized the U.S. government to compel

(Continued on Page 6)

HIS Increases Speed Of Level 66 CPUs Without Hiking Costs

By Esther Surden
Of the CW Staff

WALTHAM, Mass. – Honeywell Information Systems, Inc. (HIS) has increased the performance of its Series 60/Level 66 batch-oriented mainframes with no corresponding increase in price, the firm announced last week.

Also announced were multiprocessor capabilities for the 66/05 through 66/80 systems; another version of the entry-level 66/05 introduced in June; a change in memory from 1K MOS random-access memory (RAM) chips to 4K RAM chips to allow the Level 66 systems to accommodate more memory; and a dual-spindle fixed disk.

The enhanced 60/66 system, available

(Continued on Page 3)

New Trial Ordered in Catamore

BOSTON – The U.S. Court of Appeals here has vacated a lower court decision ordering IBM to pay Catamore Enterprises, Inc. $11.4 million and ordered a new trial for the case.

The appeals court ruled the lower court erred by allowing the jury to find that both a written systems engineering services (SES) contract and two oral contracts were valid at the same time.

The SES contract had limited IBM's liability to one year and the case was filed after that time limitation had run its course.

"It seems to us that when a supplier and its customer, neither of whom is helpless in the marketplace, agrees on terms limiting the period of liahility for future services to one year, those terms must be respected," the appeals court's opinion said.

"At the second trial, Catamore may attempt to escape the limitations in the SES agreement by establishing that it was induced to enter into it by fraud," the court added.

Calling the case a "paradigm of complex litigation rivaling the complexity of the cybemetics era from which it arises," the court also said its decision did not capture "the full flavor of Catamore's case in its assertions and evidence as to negligence, fraud and misrepresentation" on the part of IBM.

In reaction, Catamore said that "although we are disappointed at the vacation, we note that the court did not rule out fraud and in its opinion appeared to endorse negligence" on the part of IBM.

An IBM spokesman, however, said the appeals court ruling "confirms our belief that the original verdict was contrary to the evidence and the law."

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'Intelligent Silicon' Credited

Machines Cheaper Than People: Bowen

By Esther Surden
Of the CW Staff

MONTREAL – "A dramatic reversal has occurred in implementing hardware and software systems: machinery has become cheaper than people," Archibald Bowen, professor of systems engineering at Ottawa's Carleton University, told an audience at the Canadian Computer Show and Conference here last week.

Speaking on "Intelligent Silicon," Bowen noted increased production is resulting in a dramatic decrease in price, and silicon – the major component of semiconductor technology – has become the universal medium for implementing algorithms.

Two trends have become visible in hardware over the last decade, Bowen said. First, companies have tended to centralize the algorithm in the CPU, leading to massive CPUs.

With the advent of the microprocessor, however, even IBM is ready to admit "there may be something to the concept of distributed processing" – the second trend.

A dramatic reduction in the cost of silicon has resulted in the processor costing no more than its chips. Because of this, multiprocessors in cooperative nets are a reality, Bowen said.

Memory also has decreased in cost to the point that many people believe it could be given away without altering the price of the system. This is a bit exaggerated, he said, but charge-coupled devices and bubble memories are just over the horizon.

This type of memory technology will rival disk and tape and soon replace Mylar as a bulk storage medium, he predicted. Problems such as volatility still exist, but they are quickly being overcome, he added.

"It is now possible to conceive of hardware systems that are programmed to user needs. Silicon is cheap and people are expensive," Bowen said. The trend of the future will be toward customizing, even to the extent the user throws away half of the available power to use only that which suits his needs.

In software, the major trend is toward sharing because many techniques formerly implemented in software are now being implemented in hardware, Bowen said.

Since processing will be distributed between a set of nodes and start at the point where data is entered, new software must be developed to accommodate this. Software must be systems-oriented.

In the long run, computers will become like cars – supplied with a set of standard options – and the days of designing a computer and writing applications software will have passed, Bowen predicted.

IBM Announces Price Increases For Certain Products From GSD

ATLANTA – IBM last week announced increased prices effective Jan. 1 for selected General Systems Division (GSD) products.

The announcement included the following:

- A 5% increase in the Monthly Availability Charges (MAC).
- A 15% increase in the Minimum Monthly Maintenance Service Charges (MMMC).
- A 15% increase in Systems Engineering Services rates (SES) for all new contracts.

A 5% rise in Extended Term Plan (ETP) charges effective immediately was also announced. However, standing lease contracts will not be affected, IBM said.

Purchase prices and prices under the Term Availability Plan (TAP) for 36-month leases were not affected by the increases, IBM said.

The MAC price hike will affect all products in the GSD line except the Model 5230 data collection station, 5447 disk storage unit, eight models of the System 32 and two models of the IBM 3 introduced last month, a spokesman indicated.

The MMMC increases will not affect the 5100 portable system, older System 32s or the 3/4, 3/6, 3/8 or 3/15 systems, the spokesman noted.

The 3/10 and 3/12 as well as some of their associated features and attachments will not be affected, he stated.

The ETP increases hit the 3740 family of data entry equipment, the spokesman noted. For example, the 3742 programmable work station, which cost $176/mo under the old ETP, now costs $184/mo.

The purchase prices for these products were recently reduced 25% [CW, Sept. 20].

The 3741 data station, which previously cost $148/mo, will cost $155/mo and the 3747 will cost $433/mo compared with $413/mo previously.

The MAC price for the 3/10 Model A-6 will be $1,242/mo compared with the previous $1,185/mo price.

If the Model A-6 is tied into a configuration composed of a Model 5424 A-1 multifunction card unit, 5422 disk, 1403 N-1 printer, 5444 A-1 disk with 3271 control unit and a 3874 or 3277 display station, the entire system price will change from $3,143/mo to $3,221/mo, an increase of about 2%, the spokesman explained.

The MAC for the 3/15 Model C-21 processor with 164K of memory was $3,229 and will be $3,383.

The MMMC for the 3/10 will rise from $61.50/mo to $70.50/mo.

Fast Calcomp Verdict Expected

(Continued from Page 1)

cluding those turned up in previous suits against IBM such as those filed by Telex and Control Data Corp. as well as the concurrent Justice effort, he explained.

Although IBM initially presented three counterclaims, two have been deferred. The remaining counterclaim, which will be included in this case, involves IBM's charge that Calcomp stole trade secrets.

The deferred charges alleged that Calcomp violated IBM's patents and that it monopolized the plotter market.

Kilpatrick said his understanding of the procedures in the case are that Calcomp will present its case and IBM will conduct its defense. IBM will then present its countercharges, followed by Calcomp.

In the meantime, IBM's lead attorney has been working out of the Regency Hyatt Hotel here. Thomas D. Barr took deposition from George Canova, current Calcomp president, the week of Sept. 18.

Remarking IBM may be saving "the best until last," Kilpatrick said he is awaiting being deposed, presumably also by Barr.

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HP Adds 1000 Family With CPU Faster Than 21MX

By Esther Surden
Of the CW Staff

PALO ALTO, Calif. – Hewlett-Packard Co. (HP) last week introduced a family of small systems called the 1000 series which it said includes a processor 60% to 100% faster than its present 21MX-based systems.

Designed for computational, instrumentation and operations management users, the four 1000 systems are in the range of the Digital Equipment Corp. PDP-11/34 and PDP-11/45, Data General Corp. 3/D and 8/30 and Modular Computer Systems, Inc. Modcomp II-based systems, according to a spokesman.

The 1000s feature an optional increased microprogrammable control store space to allow users to completely reconfigure the systems if necessary, HP said. Image data base management software is available for the system.

Although current users of 21MX-based systems cannot upgrade to the 1000 family in the field, the processor is software-compatible with the 21MX processor, the spokesman noted. Most key peripherals can be transported from 21MX systems to the 1000 machines and HP expects to continue supporting the 21MX-based users, he added.

The 1000 processor features "dynamic micro cycle timing" which allows the CPU to "determine" the instruction cycle time necessary for the next execution and vary the cycle time according to need, he said.

Slower functions take 280 nsec while most operations are completed in 175 nsec, HP said.

The 8.5K of control store space allows users either to design microprogrammed subroutines for the system or use HP-supplied software. The software lets users develop microcode in the background and also provides a histogram of the functions the CPU is spending the most time performing.

The software package costs $1,000. Writable control store costs $2,000 for 1K.

The system console is the Model 2645 CRT terminal introduced last month [CW, Aug. 30]. It includes two built-in cartridge drives so programmers can plug in, modify and remove programs stored on the cartridges, the spokesman stated.

Image/1000 data base management software requires a minimum of 32K words and is a multiterminal, multiprogram enhancement of Image/DOS, HP said. It allows data to be accessed sequentially, directly or randomly by keyword value.

Optional distributed system software which allows a central 1000 disk-based system and other HP systems to share peripherals and data base files is available.

The Model 30 with 64K bytes of semiconductor main memory, 15M bytes of disk, the Model 2645 CRT display console, desk and RTE-II real-time executive costs $37,500.

The Model 31 is a cabinet-oriented unit with a 5M-byte disk and costs $33,500.

The Model 80 desk-type system with 128K bytes of semiconductor main memory, CRT console, 15M bytes of disk, 200 line/min printer and 1,600 bit/in. tape drive costs $62,600.

The Model 81 in upright cabinets costs $63,600.

Image 1000 for models 80 and 81 ordered before Jan. 1 will be free, the spokesman said. The normal price of the Image software is $6,000.

HIS Ups Throughput Of Level 66 Systems

(Continued from Page 1)

January 1977, are the result of "proprietary engineering changes within the central processors," HIS said. The 66/10 now runs 62.5% faster than its predecessor; the 66/20, 65.4% faster; the 66/40, 58.1% faster; and the 66/60, 35.7% faster, according to an HIS spokesman. He would not comment on what engineering changes were made to the CPUs.

HIS is working on a way for current Level 66 CPU users to upgrade to these new performance levels, but the capability is not available at present.

Dual or tandem system capability has also been added to the Level 66 systems.

Previously, the 66/40, 66/60 and 66/80 could run dual processors; the 66/20, 66/40, 66/60 and 66/80 could run tandem processors; and the time-sharing models 66/7 and 66/17 could not run either dual operations or in tandem, the spokesman noted. Now dual and/or tandem systems are offered throughout the Level 66 line, he said.

An additional central processor for the Model 66/05 can be purchased for $223,230 or $5,315/mo on a five-year lease; a second processor for the Model 66/10 costs $261,408 or $6.224/mo."

The version of the Model 66/05 introduced last week differs from the previously announced system in that it incorporates a 24K-word memory front-end network processor that accepts up to eight communications lines, HIS said.

The previous model featured a nonintegrated Datanet communications processor; for heavy communications needs, users of the latest version can add another Datanet processor, the spokesman said.

The CPU with the integrated processor costs $322,684 or $6,917/mo on a five-year lease. The system will be available in the third quarter of 1977.

The memory and mass storage enhancements were designed to allow system expansion for those users wanting more memory or mass storage without an increase in processing power, the spokesman explained.

The change from 1K RAM to 4K RAM chips allows the Models 66/10 to 66/40 to accommodate up to 1M words; the 66/05 can be expanded to 512K words, HIS said.

HIS hopes to allow its users to upgrade to the expanded memory in the field, but is unable to announce the capability at this time, the firm said. A 64K memory module that would increase the 66/05 to 256K words costs $66,360 or $1,580/mo.

Also introduced with the enhancements was a high-density fixed disk. The MSU0500 dual-spindle storage device has a capacity of 940M formatted characters, HIS said.

The disk features simultaneous access to any two drives through use of a dual port and a 1.597M char./sec transfer rate.

The mass storage unit, which will be available in late 1977, costs $47,500 or $1,089/mo on lease.

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WANG

Reform Act Attacked at Hearings As 'Grab for Monopoly Power'

(Continued from Page 1)

billion for private-line services alone, Grant said.

"AT&T, then, is growing annually by an amount larger than our total piece of the action," he pointed out.

'Would Destroy Industry'

Also speaking for the specialized carriers was Herbert Jasper, executive vice-president of ACCT, who said "the Bell bill would destroy our industry."

The ad hoc committee was formed to expose the "reckless charges and false claims" made by Bell and its telephone industry allies in opposing competition and promoting legislation to establish a statutory monopoly, Jasper told the subcommittee.

"Bell suffers from the Charlie Wilson syndrome. It believes what's good for Bell is good for the country." Pursuing this belief, AT&T has constructed a virtually "no lose" situation for itself, he said.

"After exploiting every possibility for delay and procedural advantage in both the regulatory and judicial appeal processes, Bell is now using its economic and political muscle to enlist the Congress in its anticompetitive strategy," Jasper said.

"AT&T wants you to believe there is a crisis in telecommunications," William McGowan, chairman of MCI Communications Corp., told the subcommittee.

Bell has insisted "the battle against competition be fought not in the marketplace, fully and fairly, but rather on the regulatory, legal, lobbying and propaganda fronts," he added.

As long as Bell can keep its legislation before Congress, it can claim its proposals are "under serious consideration, and this in turn can do great damage by confusing and intimidating prospective investors, potential competitors, customers, equipment suppliers, employees and even regulators," McGowan said.

Representing the Independent Data Communications Manufacturers Association (IDCMA), Arthur Carr, president of Codex Corp., said the members of his organization have provided users with equipment that reduced costs and increased efficiency.

"IDCMA member companies have been able to introduce breakthroughs in technology years ahead of the telephone company," Carr said, adding "much of that equipment is still not available from" the phone companies.

Each of the data communications companies has met "the key test" by providing services not offered by existing carriers. As a result of this innovation, computer communications equipment prices declined even while the cost of carrier services was increasing, he said.

Various independent studies have shown the interconnection of customer-provided equipment to the telephone network poses no more threat to the technical integrity of the network than carrier-provided equipment, he added.

In this regard, telephone company trouble reports show carrier-provided computer communications equipment "is more frequently the reported source of trouble than customer-provided equipment," he said.

Carr urged the subcommittee to look into AT&T's practice of bundling charges under which the cost for data communications equipment is lumped together with the price of transmission service.

With these types of charges, the user cannot effectively compare the cost of AT&T service with the cost of owning his own equipment, he said.

The proposed Reform Act would give the telephone company control over data communications terminal equipment and would eliminate competition in this area, according to Peter McCloskey, president of the Computer and Business Equipment Manufacturers Association (Cbema).

If the Reform Act was passed, Congress would be helping to kill the terminal equipment competition "on the mistaken theory that this will protect the residential user of telephone service," he told the subcommittee.

Citing a recent study by the National Association of Regulatory Utility Commissioners (Naruc), McCloskey said it had been shown that competition for terminal equipment would cause no harm to the telephone companies.

The Naruc study found data communications terminal equipment "clearly does not fall within the traditional concept of telephone service."

The public interest would not be adversely affected if the computer industry were to provide substantially all of this type of terminal equipment to users, the report concluded, according to McCloskey.

The carriers supporting the Bell-sponsored legislation are not satisfied with a large percentage of the projected terminal equipment growth. They want more, even if it means crippling existing competition, he said. "You shouldn't let this happen," he told the subcommittee.

Also addressing the legislators was Rep. John M. Murphy (D-N.Y.), chairman of the House Subcommittee on Consumer Protection and Finance, who said Bell is not really worried about MCI and the other small entrants seeking to provide specialized services.

The Bell System "is really worried that somewhere down the road a company like IBM, with billions of dollars at its disposal, will take advantage of the blurred interface between data processing and data communications to provide services the Bell System thinks belong to it," Murphy said.

Correction

Users will spend $1.4 billion, not $1.4 million, on DP supplies in 1976, according to the results of a Datapro Research Corp. survey reported in the Special Report on Security and Supplies [CW, Sept. 27].

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Datran Users Prepared for Shore Before Ship Sank

By Molly Upton
Of the CW Staff

WASHINGTON, D.C. – When the Data Transmission Co. (Datran) closed down its network Sept. 15, the only users still on the system were using it as backup while they debugged their new communications arrangements, according to Bob Schumacher, formerly manager of financial planning and analysis for the now defunct company.

To his knowledge, no one was left without an alternative source when the plug finally was pulled, Schumacher said.

The estimated number of customers still using some of the firm's nationwide digital communications facilities on Sept. 15 was perhaps 10% of its original customer base, if that much, he said.

When Datran announced it was going out of business, it gave users seven days' notice. However, the Federal Communications Commission (FCC) intervened and ordered the carrier to maintain operations until Sept. 15, thus allowing users a more reasonable amount of time in which to find alternative suppliers [CW, Aug. 30].

No Complaints Received

The FCC has not received any complaints from users unable to procure alternative services by that date, a spokesman said.

"All the carriers were very cooperative in helping customers find alternative services," he observed. "Since we've heard nothing to the contrary, we assume all customers that sought other services were able to obtain them within the time frame," he said.

Datran's assets are now under the administration of a receiver, Stanley J. Samorajczyk, who is evaluating bids by parties interested in obtaining all or part of the network.

The FCC, in order to make the Datran network more marketable, plans to keep the radio licenses needed to operate the 22 microwave links as part of Datran's property, the spokesman noted.

The FCC move, effected by not processing the renewal applications, allows future purchasers of Datran facilities to obtain the licenses and then apply for their renewal, he said.

Normally the FCC does not let such facilities remain unused, he added.

The Southern Pacific Communications Co. (SP) made an agreement with the receiver to keep the Kansas City-St. Louis link operating at its own expense to serve SP customers until formal disposition of the system is made, according to Rex Hollis, SP vice-president of marketing.

Only SP Interested in Datran

ALEXANDRIA, Va. – As the Oct. 12 bankruptcy hearing date approaches, Southern Pacific Communications Co. (SP) is the only bidder so far for the remains of the Data Transmission Co. (Datran) network, according to receiver Stanley J. Samorajczyk.

SP has offered to buy the entire network for $1 million. If it cannot, it is willing to pay $300,000 for the Kansas City-St. Louis link, which it utilizes for its system, an SP spokesman said.

Samorajczyk is communicating with other potential bidders and said he hopes there will be other bids presented at the hearing.

Administratively, it makes no sense to sell the network as an entity, he said. If there are no acceptable offers for the entire system, however, the bankruptcy judge will consider selling pieces of the system, he added.

The hearing will be held here at 2 p.m. on Oct. 12 at the U.S. Bankruptcy Court, 206 N. Washington St.

Tenn. Finally Opts To Go With Amdahl

By Toni Wiseman
Of the CW Staff

NASHVILLE, Tenn. – Tennessee finally decided on the newest addition to its centralized DP facility – an Amdahl Corp. 470V/6.

The machine was installed Sept. 20 and the Information Systems Division was running diagnostics by Wednesday, according to Ronald L. Woodall, assistant director for the division.

Much of the controversy over the acquisition had centered around the notion of retaining the current IBM hierarchy of multiple machines or going to a single large computer [CW, Aug. 23].

The state DP center currently has an IBM 370/158, 370/155 and 360/50. "We're a central data processing facility for the entire state and that means we have a lot of teleprocessing work, so I'm reluctant to release the 158," Woodall said.

The center will, however, probably release a 370/155 while retaining the 370/158 for backup and as a test bed, he said. There are some applications that may run better on the IBM machine than on the Amdahl 470V/6, he added.

The 470 is an outright purchase and is subject to a performance test period of 30 consecutive days of uptime, he noted.

Woodall plans to put production work on the 470 immediately while at the same time benchmarking the machine to come up with a coefficient for the state's users billing algorithm.

Large MVS System

He noted the state is bringing up a large system for integrated traffic records which will run under Multiple Virtual Storage (MVS), an IBM system control program.

The question of running IMS/VS on an Amdahl had also been under fire during the request for proposal review since, at that time, there were no shops running MVS systems and only one running a Single Virtual Storage system, he said.

Woodall said that in the future the 370/158 would probably be used under MVS while the Amdahl 470V/6 will be an MVS machine.

"I don't anticipate any difficulties," Woodall said. "The installation went very smoothly and the Amdahl people are very professional."

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AT&T Head Calls at Hearings for Halt to FCC Rulings

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – Congress should put an immediate moratorium on the competitive experiments of the Federal Communications Commission (FCC) "until their long-term consequences have been fully explored," John D. deButts, AT&T board chairman, said here last week.

Speaking as a witness at hearings before the House Subcommittee on Communications on the proposed Consumer Communications Reform Act of 1975, deButts said the subcommittee should "direct the FCC not to proceed further with its policies until this committee has had a full opportunity to review these important issues."

Present FCC policies are "undermining the telephone companies' ability to keep service as widely affordable as it is now." As a result, the rates for services will have to rise to match the cost of providing those services, he warned.

While there may be temporary advantages for some large businesses in the "FCC's brand of selective competition," to most people, "including those on fixed incomes, it will represent an added burden of higher rates.

"This we believe is the exact opposite of what Congress intended the nation's telecommunications policy to be," deButts told the subcommittee.

In answer to questions from individual subcommittee members following his prepared testimony, deButts admitted that while the bill is called the Consumer Communications Reform Act, no consumer group has come out in favor of the proposed law.

He also estimated the Bell System has spent $600,000 for lobbying, but denied that any Bell employees are working full-time on the effort.

The proposed law was a joint effort and was put together by various companies and interests in the telephone industry, deButts claimed.

In a later question period, however, Frank Barnes, president of the U.S. Independent Telephone Association (Usita), told the subcommittee much of the work on the bill had been done at Usita headquarters here with representatives from independent phone companies working together with "authors" from AT&T.

Rep. Timothy Wirth (D-Colo.) attempted to establish with several witnesses that telephone companies had sent out information on the Reform Act with monthly customer bills. He cited one instance to deButts in which New Jersey Bell had sent out such material.

The AT&T chief admitted this had happened in New Jersey, but said the practice has been stopped within the Bell System.

Wirth asked Barnes whether the independent phone companies had sent out similar pro-Reform Act material. The Usita chief noted each member company is free to set its own policy but, he said, some probably had done so.

In answer to a related question, Barnes said costs for such literature were probably deducted as a business expense by the phone companies for tax purposes. Wirth then asked whether Barnes realized it was against the law to deduct lobbying expenses on corporate tax returns.

John F. Morgan of the Telecommunications International Union testified that "a major increase in safety hazards is due to improperly installed equipment purchased from the newer communications equipment vendors."

Morgan, however, was unable to cite specific cases where such safety hazards had been discovered.

Oil Embargo Tactics Begin Tests Today

(Continued from Page 1)

these companies to share domestic oil supplies with other countries.

During the test, a control group working here will pose and post hypothetical interruptions of the oil supply. These interruptions might consist of cuts in Arab oil production and bans on oil shipments to particular countries, for example.

Another control group of oil executives and international civil servants will assess the severity of the problem and relay data to the 32 oil companies via the computers and telecommunications system.

The system will be used by these companies, in turn, to advise Paris of possible shortages of specific petroleum products in particular markets. The oil companies will take into account the stocks they have on hand at sea and inform the IEA how much oil they can divert to short markets and how soon.

The simulation represents the first time the entire system has been tested. In the past, IEA has tested only whether the oil companies have standardized the way they keep and transmit their data in keeping with the agency's instructions, according to Richard Martin, deputy director of the Office of Fuels and Energy in the U.S. State Department.

While any remaining communications, data accuracy and compatibility problems are likely to be worked out in the next several weeks, the test will not prove the full readiness of the system, IEA said. Whether ships can be rerouted the way the oil companies say they can will remain untested.

In addition, without a real political crisis, there is no meaningful way to test the willingness of unaffected governments and companies to risk the possible repercussions of cooperating with countries that have been subjected to embargoes or reductions in shipments, the IEA stated.

How to divert oil to short markets without precipitating steeper prices is yet another problem the simulation will not test. While the governments have agreed prices will not be "discriminatory" or produce "excess profits," no one knows what practical limits will eventually define those terms, U.S. officials said.

Although the U.S. took the lead in the alliance between governments that resulted in establishing the IEA, it will not participate formally in the test.

In accordance with the Energy Policy and Conservation Act of 1975, however, the U.S. government will send observers here to oversee the actions of the participating oil companies to guard against breaches of antitrust law, Martin said.

The simulation will meet one major goal of the IEA: to show the oil-exporting nations the importing countries will assist each other in crisis situations.

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Congress Gets Bill Limiting All Access To Citizens' Financial, Telephone Files

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – Congress has received a bill prohibiting banks, credit-card companies and telephone companies from turning over individuals' records without their consent unless such action would jeopardize a criminal investigation.

The "Right to Private Records Act" (H.R. 15657) would restrict access by persons in the private sector as well as by state and local governments to records concerning an individual's financial transactions and telephone toll calls, according to Rep. Edward I. Koch (D-N.Y.) and Rep. Barry Goldwater Jr. (R-Calif.), who introduced the bill.

In excluding all private sector individuals as well as state and local governments from routine access to these personal records, this bill goes further than H.R. 214, introduced earlier this year. That bill applied only to the Federal government.

H.R. 214 was approved by the House Judiciary Subcommittee on Courts, Civil Liberties and the Administration of Justice and is now before the full Judiciary Committee, according to a Goldwater staff member.

In allowing dissemination of an individual's records, the new bill requires one of the following:

- The individual's written consent.
- An administrative subpoena which the individual could challenge.
- A judicial subpoena with notice to the individual except in cases where a criminal or civil investigation would be jeopardized.
- A court-authorized search warrant with notification to the individual.

The proposed law also would require the recordkeeper to maintain an accounting of all record disclosures.

Individuals whose records were unlawfully obtained could sue for actual and punitive damages; violators could be punished by imprisonment for not more than one year and/or a fine of not more than $1,000.

In addition, the legislation provides limits on supervisory monitoring of telephone conversations.

In a statement issued jointly, Koch and Goldwater said "state and local governments and persons and organizations in the private sector should not be permitted unrestricted access to citizens' credit, bank or utility records on whim or for insufficient reason when the Federal government will be prohibited from these odious practices [if H.R. 214 is passed].

"Citizens should be secure in their belief that no government agents (federal or local), representatives in the private sector or simply another private citizen can have access to the files of other citizens except under rigid restrictions and crime-regulated procedures."

It is "essential" to point out the new law does not get in the way of any legitimate request for information by the law enforcement community, the Goldwater staff member said.

In addition to protecting the individual, the proposed law would protect financial institutions by clarifying their responsibilities in response to subpoenas, the staff member said.

At the moment, there are about "100 different kinds of subpoenas that can be thrown at them and banks don't often know the difference between them," he explained.

The bill was prompted partially by a recent Supreme Court decision in Miller vs. California in which the court ruled bank records belong to the bank, not the individual, the aide said.

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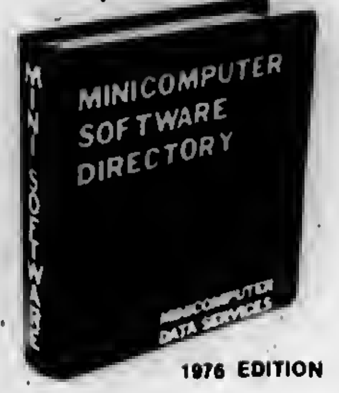

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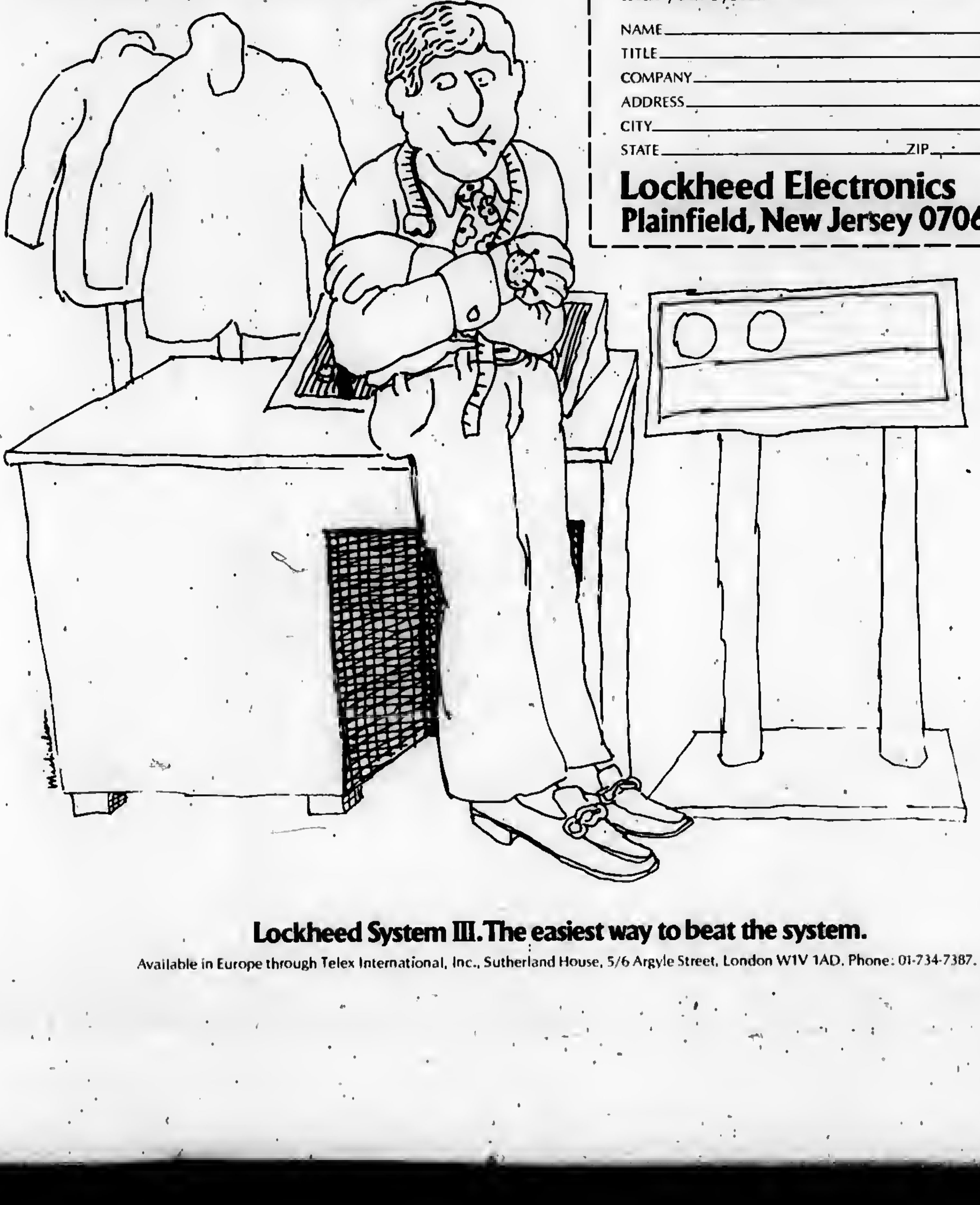

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Phone Lines Tie Sensors to CPU

DP-Based Security System Guarding Boston Schools

By Nancy French
Of the CW Staff

BOSTON – City officials have installed a well-publicized computer-based security system to reduce vandalism committed in public schools here – destruction that last year reached $4 million.

This year the security system guards 55 school buildings. Eventually 133 of the city's 200 schools will be protected, according to Deputy Mayor Robert J. Vey.

The system, a JC-80 from Johnson Controls, Inc. of Milwaukee, monitors entry and movement in the schools by means of sensors on doors and motion detectors in both interior and exterior locations.

The sensors, tied to the JC-80 by leased telephone lines, transmit seven-point binary code to the processor at the rate of 300 signal/min, according to Stephen Barvenik, a local Johnson sales representative.

The processor decodes the signals received and converts them to digital form for processing by the computer.

If a door is opened or an intruder inside a school activates a motion detector, a circuit is broken. The computer immediately activates alarms in the central security station and in the school building.

In the central station, a printout identifies the school and location of the sensor and instructs the operator on what action to take. In most cases, the operator would radio dispatch a security guard in a patrol car to the site.

The system can also detect tampering with the telephone lines by means of parity bits in the code, according to Barvenik.

Seven operators assisted by 12 unarmed security guards have been hired to cover the computer station and patrol the schools around the clock, according to city officials.

Should Deter Vandals

The system is aimed at deterring vandals before they can do any damage rather than apprehending criminals, Vey said. Most vandals are juveniles, Barvenik noted.

The JC-80 includes a Modular Computer Systems, Inc. processor with 32K of magnetic core memory. Core was chosen rather than integrated circuits because of possible exposure to high temperatures, Barvenik explained.

The processor, expandable to 64K, is equipped with a 512K-byte Digital Design magnetic disk, two keyboard send/receive teletypewriters, one Tally Corp. line printer and one Johnson CRT.

Boston officials do not expect to eliminate vandalism simply by installing a computer system. However, the JC-80 will enable this city to defend itself against destruction of school property better than most other major cities, officials said.

The contract with Johnson was estimated at $300,000. Computer operators, security guards and telephone lines will make annual operating costs significant, they added.

But the system is said to be doing the work of 133 men and officials hope it will pay for itself within two years by measurable decreases in destruction of school property.

Although it is too early to tell, a survey of school custodians indicated a drop in the number of break-ins, officials said.

A rabbit that got loose in one of the schools set off one of the motion detectors and activated the entire warning system, Barvenik added.

In addition to security, the system will be used for monitoring and controlling heat, ventilation and air conditioning systems, a city official said.

Dartmouth to Develop Retrieval System To Locate Art Work

HANOVER, N.H. – Dartmouth College will design and develop a computer-based system for retrieving visual information such as works of art, photographs of minerals, star maps and anatomical illustrations under an $87,500 grant from the Exxon Education Foundation.

The project involves developing a control unit to link an off-the-shelf microfiche projector from Image Systems of Culver City, Calif., and an ordinary computer terminal on the Dartmouth Time Sharing System, according to Prof. Arthur W. Luehrmann, assistant director of the Office of Academic Computing and assistant director of the Office of Instructional Services and Educational Research.

The computer will be used to store a data base of information describing each image recorded on microfiche, including its address in the fiche storage unit.

The user will be able to key in the work he wishes to see via the terminal; the computer will feed a stream of data to the control unit linking the terminal and the microfiche projector, according to Luehrmann.

The data will include the address of the fiche by row and column, and the projector will locate the work and display it for the user in a matter of seconds.

The fiche is made from 35mm color slides using "old-fashioned" photographic processes although the system could be adapted to computer output microfilm (COM), Luehrmann said. In a text application, for example, COM could be made into fiche and stored in the projection unit.

"Then our system could be used to retrieve the pictures," he explained. "You could also update it fairly quickly because the COM can be written by computer and developed in 20 minutes."

In addition to student use in art history courses, Luehrmann envisions the system's use in medical education – "There are some things in medicine you just have to see to understand."

The National Library of Medicine circulates large collections of information on fiche, and right now retrieval of that information is fairly complex, he said.

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Industry Forced Into Electronics Age

Supermarts' DP Seen Reaction to Modus Operandi Gap

By Toni Wiseman
Of the CW Staff

DENVER – The food industry's use of computers, electronic point-of-sale (POS) and scanning is basically a reaction to a void in its normal modus operandi, attendees of the Super Market Institute's annual DP conference were told here recently.

Since mechanical registers are simply no longer available, supermarkets have been forced to move into the electronics age, being pushed rather than going of their own volition, according to Dale Argotsinger, director and manager of training for King Soopers, Inc.

"Speaking from the grocery end of the industry, we have people who are having to learn new terms and volumes of data. This is a big step for users, particularly when you consider that many of our managers today started as courtesy clerks and checkers before moving into management," Argotsinger said.

Faced with the necessity of deciding on a POS system, King Soopers found there were about 12 vendors from which to choose. The first questions the company had to ask itself were which vendors would be around for a while and whether those vendors would be able to provide service on an ongoing basis.

Other questions included: What kind of information does the system provide? Can it automate scheduling? What information will it give customers that will benefit them when they look at their bill? Can the system be upgraded or is it stalemated?

Eight Systems Planned

King Soopers settled on the NCR 255 system and by the end of last week had eight systems installed, each consisting of registers with an in-store, minicomputer operating as the controller, he said.

The minis function in the regular store environment and need no extra air conditioning, Argotsinger noted.

In addition, each store installation includes a backup power system which can operate four terminals for 90 minutes if power is lost.

If communications between the controller and registers are lost, the NCR registers can function off-line, he said. However, this is not an optimal situation because data would have to be collected from the terminals and later allocated on a percentage basis to various departments, he added.

King Soopers found that as it moved toward the initial installation in May 1975, it had to work with the vendor to establish the kind of keyboard with which it would feel comfortable and which would give it the data it felt was important.

"This goes back to the fact that our industry is reacting to the system rather than innovating it," Argotsinger said.

The number of problems which can be encountered in changing from mechanical to electronic registers is vast, to say the least, Argotsinger indicated.

"There are vast numbers of people who are familiar with computers and the computer world, but there are also a number of checkers and management people who are afraid of that world and were consequently not accepting the new system," Argotsinger said.

"We needed to give them the understanding that the system was a simple one," he noted.

King Soopers determined the changeover from a mechanical to an electronic environment would require a minimum of 16 hours of training on the registers for both checkers and managers, he said.

This included two hours to learn what information could be entered and extracted from the system as well as the new terminology associated with it.

Six hours of training in the touch system of operation were scheduled to develop checker productivity in a training mode. Another four hours were allotted for working with groceries.

Finally, the checkers spent four hours in a training store working at a checkout stand with customers while being observed by a trainer, Argotsinger said.

Checkers were assigned to an already-converted store for an additional eight hours in a work environment with customers before their store went on-line, he noted, adding this was a problem before the first store changed over.

"We ask management people to go through the same training process and then go into a management training program," Argotsinger said. "They will spend 32 hours working in a store which already has the system in, working primarily in closing down, getting printouts and doing accounting and programming.

"Then, when their store opens, we provide them with skilled people who have been with the system for three to four months to help management during the opening week," he explained.

King Soopers has had very little trouble with the system mechanically, he noted. The main problems were encountered when the first store opened and checkers had insufficient experience working with both the new registers and customers.

There was also a consumer problem since the store had not distributed handout sheets explaining the system in advance, so customers asked checkers interminable questions which stopped the flow, he said.

Police Chiefs Set Meeting On DP in Law Enforcement

WASHINGTON, D.C. – The International Association of Chiefs of Police (IACP) is calling for papers to be presented at a two-day symposium on law enforcement DP management scheduled for April 18-19 here.

The symposium is aimed at bringing together law enforcement professionals and DP practitioners to discuss present and future law enforcement applications.

Additional information is available from Allen L. Pearson, Technical Research Services Division, IACP, 11 Firstfield Road, Gaithersburg, Md. 20760.

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Software Tuning, Not Upgrade, Urged for 370 Sites

By Don Leavitt
Of the CW Staff

LONDON – Tuning both application programs and the operating system on a mid-range IBM 370 VS-oriented installation may make a hardware upgrade unnecessary even with a significant workload addition, a German consultant said here recently.

A three-day study of one site with two 370/145s running under VS1 found hardware could be cut back by eliminating an apparently unneeded alternate tape channel path, according to M.A. Cooke of Computer Program Products GmbH.

The installation uses one 370/145 for teleprocessing (TP) based on Tcam, the other for batch production and testing. The disks and tapes of the systems are switchable between the CPUs, with one IBM 3330 volume used for shared libraries, Cooke told a recent conference.

The monitoring periods, utilizing a variety of Boole and Babbage measurement products, lasted somewhat less than a day for the TP system and somewhat more than a day for the batch system.

Even in that relatively short time, however, several facts emerged quite clearly, he noted.

First of all, throughput on the production machine was improved by tuning the CPU time of a "very large" batch program that had been causing a bottleneck in the system, he said.

The study showed ways, for example, of recoding a data compression routine that had used 18% of the CPU time.

Switching his attention to the TP machine, Cooke said although the CPU and I/O power of the system was underutilized during the monitoring period, "there was the possibility of a page or memory bottleneck with the addition of more on-line partitions."

Several remedies might eliminate the problem, he said. Making those modules reentrant which at present have more than one copy storage was one of the first solutions Cooke suggested.

In more general terms, he said investigating long-term fixed pages to reduce their number should help, as should efforts expended to optimize the system residency lists.

Moving to a specific idea, he said dividing the SYSI page across two packs would reduce page delay time and improve the handling of a high page rate.

Similarly, a routine to reinitiate status records was reworked with expected CPU savings of approximately 5%. Overall, several "fairly simple" changes should yield savings of 17% to 18% – "considerable savings on a program with eight hours elapsed time," Cooke noted.

Making the principal indexes of all Indexed Sequential (Isam) files resident "significantly reduced" the CPU load of the Isam modules. Further gains can be expected in this area through the use of Vsam, he added.

Using double buffering on all sequential files heavily used is expected to reduce program runtime and increase the system's ability to overlay CPU and I/O activities, he said.

Just scheduling work in a more uniform manner has cut down machine idle time and prevented overload situations by separating the two biggest jobs, he added.

Implementing dedicated scheduler work area data sets has reduced time spent in initiation/termination functions. Optimizing the supervisor residency options and BLDL lists has also improved the system, Cooke told the group.

In terms of peripherals, Cooke found making the TP machine's printer switchable would help if there are printer bottlenecks for testing jobs. The tests also indicated the two-way switch on the tape drives was unnecessary, he noted.

classification, i.e., "input" controls, "processing" controls in which the computer performs self-auditing disciplines, and "output" controls. There are controls that govern separation of personnel function and duties, and restrict certain personnel from doing certain tasks, or occupying certain areas. There are administrative controls and authorization controls . . . all designed to act as fail-safe functions for every aspect of the computer system operation.

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Where the seminar will take place

Suntech realizes that all work and no play makes for a dull three days, no matter how informative the sessions. That's why we chose Cherry Hill Hyatt House, Cherry Hill, New Jersey, as the scene for our seminar. Just 20 minutes from Philadelphia International Airport; it has all the "resort hotel" features you could wish for a lively seminar. The famous Latin Casino Theatre/Restaurant (where you'll see the shows "on the house" as part of the Seminar Package) is just down the street. Add golf (there are 18 holes nearby), tennis, swimming in the indoor pool, and some of the finest gourmet restaurants around. It all adds up to a three-day "brainstorm" you'll not soon forget!

How much it will cost

Total price of the Suntech Seminar is $525, which includes three breakfasts, three lunches, and two dinners . . . and entertainment at The Latin Casino. Of course you'll provide your own room, transportation, and beverages. Limousine service direct from the airport to Hyatt House is available. There you'll be met by Suntech attendants to help you check in and get oriented. During seminar sessions, we'll also have an Emergency Message Service (phone 609-662-3131) in effect so you won't miss an important phone call.

Attendance will be limited. Multiple reservations will receive a 10% discount for each attendee beyond the first one. DEADLINE FOR RESERVATIONS IS OCTOBER 25.

So plan, now, to attend. Fill out and mail the Registration Form right away and be ensured of one of the most informative and provocative seminars you've ever attended.

See you at Cherry Hill!

Seminar faculty

Joseph (Joe) R. Aicher
Suntech, Inc.
Joe (BS, University of Missouri – BS & MS, Drexel University) has been manager of Suntech's Data Systems Security Program for the past three years. His duties include responsibility for EDP security and right-to-privacy projects. Prior to that, Joe was manager of Suntech's Data Processing Department

Ludwig (Lou) Stern
Suntech, Inc.
Lou (BS & MS, Columbia University and Drexel University) was largely responsible for introducing computers to Sun's Engineering back in 1959. He has prepared the specifications for design and construction of Sun Company's new multimillion dollar computer center, and had previously guided the security efforts for the company's numerous computer sites

Roderick (Rod) M. Fancher, Jr.
Sun Company
Employed by Sun for the past ten years, Rod (BS & MBA, University of Alabama) is currently manager of EDP Auditing for Sun Company. In addition, Rod is engaged in developing risk evaluations and control guidelines. Earlier he had been a Lead Systems Analyst on several systems development projects

Alan (Al) Douglas
Suntech, Inc.
For the last two years with Suntech, Inc., Al (BS & MBA, Rutgers University) has led physical, and software systems security projects. He also serves as Suntech's representative to an internal Right-to-Privacy Task Force. Previously employed with Exxon Corporation, Al brings with him over fifteen years experience in the data processing field

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2. ____________________
3. ____________________

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A.

NBS Scientists Win Four Design Awards

WASHINGTON, D.C. – Scientists from the Commerce Department's National Bureau of Standards (NBS) won four awards for significant new technical products this year in a competition sponsored by *Industrial Research* magazine.

Winners and their products are:

- James S. Albus of the Institute for Computer Science and Technology for development of a cerebellar model arithmetic computer.
- David E. Sawyer and David W. Berning of the Institute for Applied Technology for development of a laser flying-spot scanner.
- Helmut Hellwig of the Institute for Basic Standards for development of a rubidium portable clock (in cooperation with Efratom, Inc.).
- David W. Allan of the Institute for Basic Standards for development of a dual mixer time difference measurement system.

Albus' memory device, inspired by the human brain's subconscious computing centers that control such daily activities as picking up a drinking glass, is currently used as a servo controller for a robot manipulator and soon will be applied to machine tool control problems and to neurological and behavioral research.

Sawyer and Berning's laser flying-spot scanner displays in a nondestructive manner the inner workings of integrated circuits and other semiconductor devices.

The scanner can be used to assist in the design of semiconductor devices and circuits and in the detection and location of marginal device elements. It can help in establishing product reliability and in providing a tool for failure analysis.

Kids Cop 'Minor' Plea After Getting DP Subpoena

NO. OLMSTED, Ohio – Steven and Sheila Peto were subpoenaed here recently for failure to pay their Regional Income Tax Agency (Rita) taxes.

Steven, 7, and Sheila, 5, are brother and sister. Between the two of them, they had only $30.

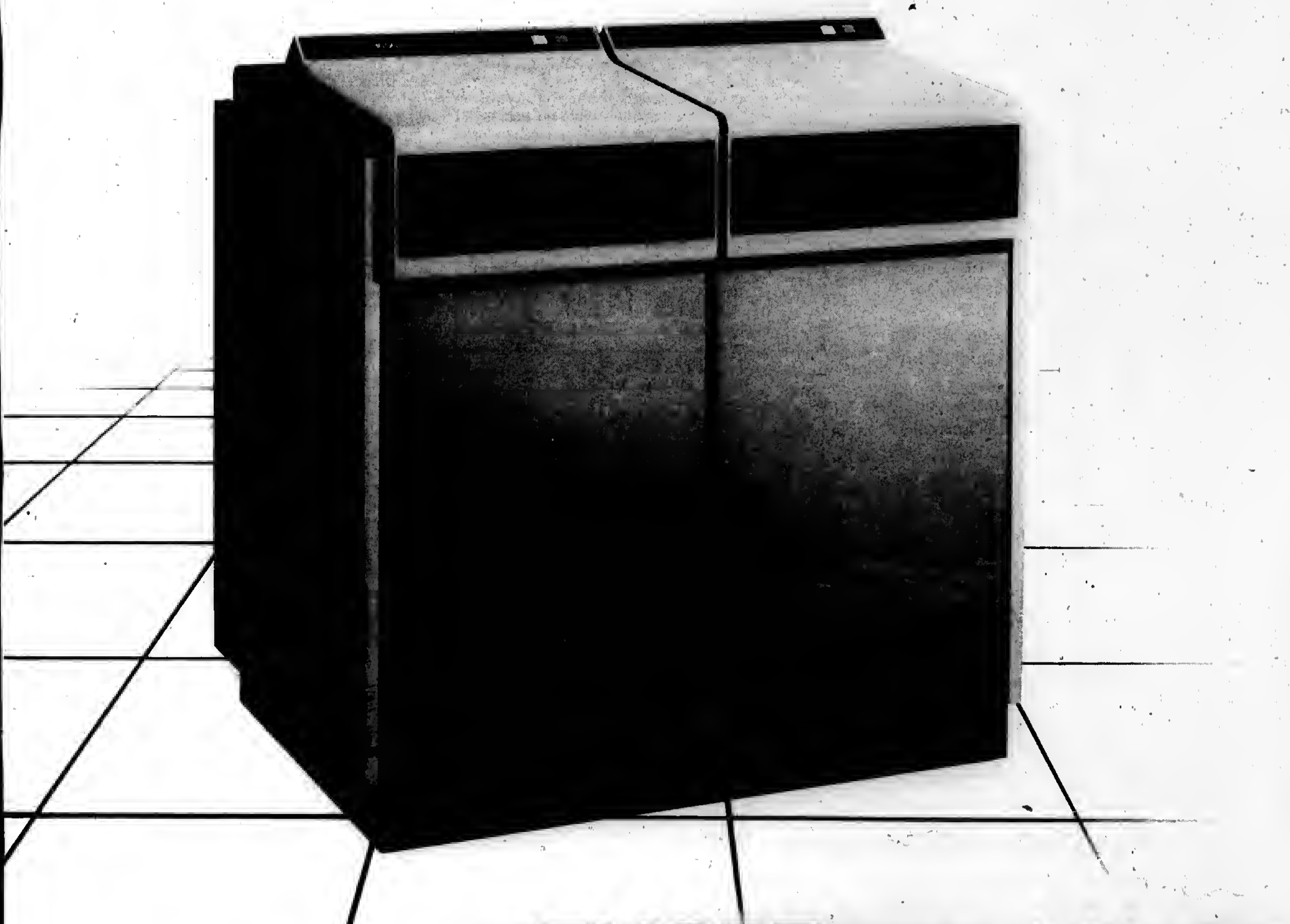
The computer-printed subpoena requested the two to bring their 1975 earnings statements to court. But their father contacted City Hall, explaining the childrens' ages, and that was that.

Why the subpoenas? The Petos recently obtained Social Security numbers for the two so they could be entered in the *Cleveland Press* Social Security Sweepstakes.

The Social Security Administration routinely shares this information with states for tax purposes, officials said.

Announcing 635 megabyte 3350 compatible disc storage for medium to large System/370's.

The 3650 by Memorex.



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Editorials

The Conservation Quest

The computer is emerging as a key tool in the quest to conserve energy resources. In recent weeks, speakers at various conferences have emphasized the varied energy-saving programs now under way that are related to DP in some way.

Control systems have been used in newer buildings for some time to optimize the use of heating and cooling systems. Powering down temperature control systems when employees are not on the premises can save on fuel.

The use of microprocessors in home heating controls may bring the computer into the home in an unexpected way. Such systems could help to keep residences comfortable and save homeowners money on fuel bills in the process.

In the auto industry, microprocessors are helping to operate "lean burn" engines to get improved mileage from smaller, lighter cars often designed with the help of computerized simulation systems.

And the energy industry is using specially tailored software to evaluate the probability of finding new energy sources under promising land and ocean areas.

IBM recently announced a laboratory device that can power down a CPU when it is not in full operation. The company reportedly has a marketing group dedicated exclusively to energy conservation applications for the System 7.

Utilities are experimenting with load balancing of electric usage. And electric customers in one area of Vermont have been trying out a "black box" that restricts electric use during peak consumption periods.

Such black boxes, perhaps with small systems, may one day limit the use of high-energy consumer appliances, like electric dryers, to off-peak hours, thereby reducing the maximum energy levels that have to be produced by generating stations.

These various applications by themselves will not have profound effects, but each little step will ultimately reduce energy consumption.

As those who know what computers can do, people in this industry should help develop similar applications whenever the opportunities arise.

A Little Hard to Believe

The recent rash of IBM price hikes for maintenance seems aimed at forcing users of purchased systems to move to newer equipment.

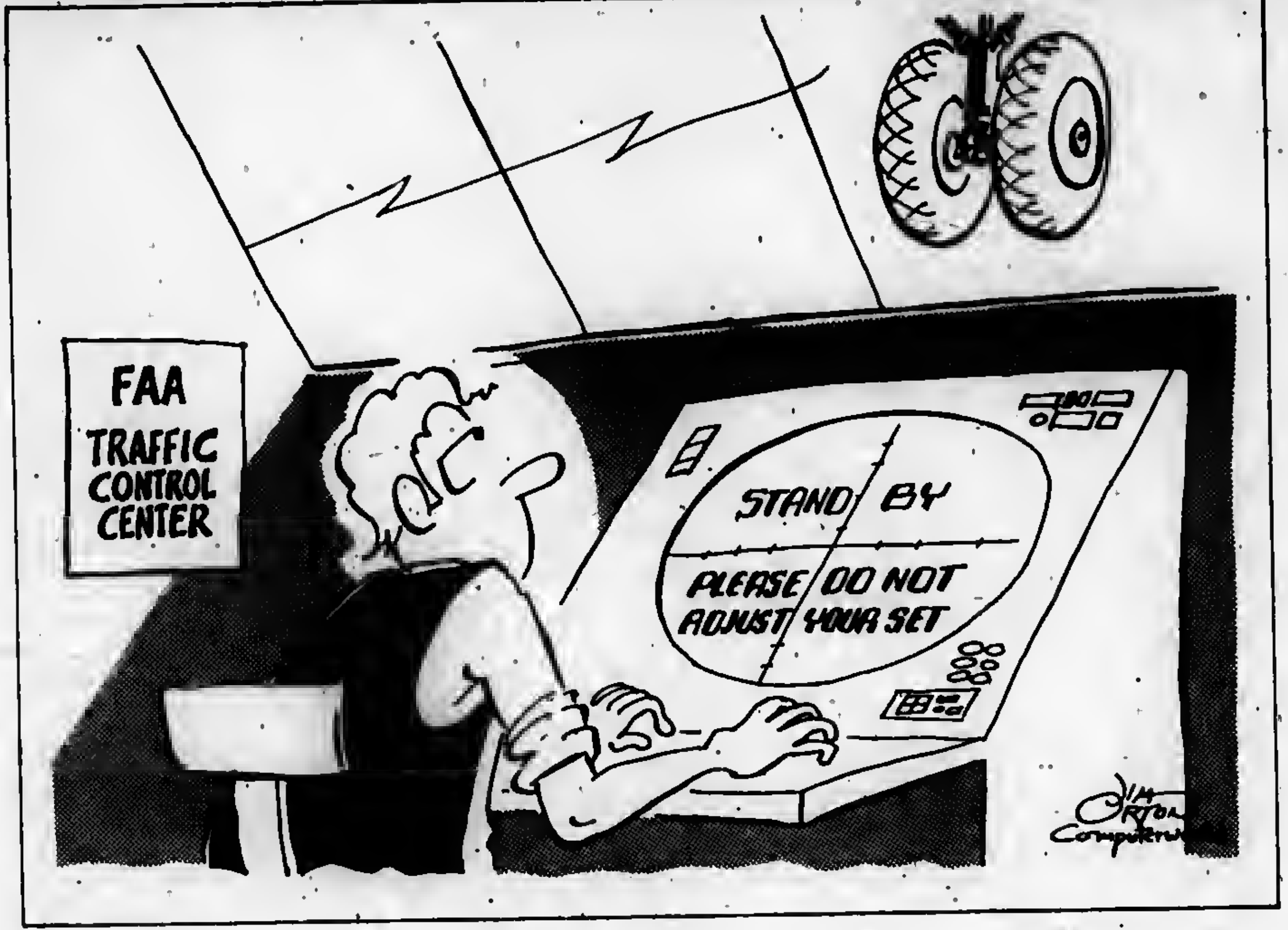
Many users install IBM equipment because they know a serviceman will never be too far away. This is especially important for users in outlying locations.

It is hard to argue with IBM's defense that the cost of maintenance and all the training and associated support is rising rapidly. Perhaps on that basis the recent increases are justified.

But maintenance can also be used to make the cost of operating equipment too high. As these costs creep up, the purchaser wonders why the recent price hikes did not apply to IBM's rental customers.

The third-party lessors claim the price increases were designed to squeeze their customers since CPUs on third-party leases are purchased machines.

The lessors may have a point. If, as IBM claims, costs are rising, then it is hard to believe it is more expensive to maintain a purchased machine than a rental machine.



Letters to the Editor

Mass Mailing Aims at Response, Not at Producing Perfect Label

The editorial regarding the label addressed to "Mr. Computerworld" ["Nobody by That Name Here," CW, Sept. 20] was entertaining, but possibly out of line.

The object of any mass mailing project is to trigger and receive a hopeful minimum percent of response, not to put out a perfect label to each and every addressee.

Just as the mailer tries for a certain minimum response from the mailees, he normally anticipates a certain acceptable error percentage. The cost to him for the service is predicated on this. Otherwise, the cost would be higher and, conceptually, out of line with little, if any, effect on the response percentage.

I believe we DP people have enough problems in our own areas without presuming to advise mass marketing people in theirs just because they use computer services for their accomplishments.

E. William Maxwell

San Diego, Calif.

Mass Mailing Problem Continues

I agree completely with the Sept. 20 editorial.

Unfortunately, this same week I received not just one, but three identical pieces of *Computerworld's* mass mail.

Perhaps CW can suggest a solution to this problem also.

Donald Weimer

Woodbury, N.Y.

For additional insight into this problem, see The Taylor Report on the opposite page. Ed.

Transparency vs. Translucency

In his article titled "Personal Initiative Only Way to Learn Documentation" [CW, Sept. 20], Joseph Rigo offered the following advice: "Learn the difference between good documentation and good writing."

Apropos to his advice, the following generalization is offered for comment: "Good writing is translucent; good documentation is transparent."

Lucid documentation is becoming more important yearly. Any exchange of information on the subject is to be strongly encouraged.

Joe McConnell

Streator, Ill.

It's Specific, Not Generic

Herb Grosch's column of Sept. 6 caught our eye here at Informatics, Inc.

We agree with Grosch that the name "Informatics" has some attraction for general use. However, the name is not a descriptive or generic term for DP in the U.S. (and other locations in the world), but is a name used since 1962 by Informatics, Inc., a software and computer services company.

The name is registered with the U.S. Patent Office as an official trademark and service mark. Further, the company has expended considerable money and effort to protect its rights to use the name exclusively.

We also agree that our industry needs a better name to call itself and the individuals in it. Burt it seems to us that "Informaticians" will go on indefinitely to refer only to those people who work at Informatics, Inc.

Walter F. Bauer
President

Informatics, Inc.
Woodland Hills, Calif.

Data Past

Five Years Ago
Oct. 6, 1971

NEW YORK – Hopes were all but dead for the preservation of RCA's Computer Systems Division by another manufacturer. Both Xerox Corp. and Control Data Corp. refused the opportunity to buy the entire division, but Xerox and Univac indicated interest in some parts of it. This uncertainty forced RCA users to order additional systems while they were still available.

– – –

NEW YORK – Three IBM 360/40s, a 360/50 and two RCA Spectra 70/45s combined to form a communications information network between the First National City Bank, Eastern States Bankcard Association and Marine Midland Bank's upstate computer center. The network provided bank charge-credit status information to participating merchants on Master Charge card holders in New York State.

Eight Years Ago
Oct. 2, 1968

LOS ANGELES – A joint suit filed by welfare recipients contended the computer system used for handling welfare checks was producing errors 10% to 25% of the time and another fail-safe backup system was necessary. No damages were sought in the action.

– – –

NEW YORK – Select, a computer system designed to aid students in selecting colleges was demonstrated at Harcourt, Brace & World, Inc., here. Prospective college students filled out questionnaires and the data was matched against courses and academic competition at 3,000 American colleges. On the basis of aptitude in 15 subject areas, a list of possible colleges was devised suiting the students' individual needs.

Sunk in Steerage

Once upon a lovely time, travel was romantic. And it wasn't just that I was young and eager, although certainly the first ten times across the Rockies are more fun even today than the tenth ten. No, it was a complex of nicer things externally, and not just my then delighted, now curmudgeonly, response.

For one thing, there was a variety of carriage. One flew Connies and DC-6s, and not a few DC-3s – but there were great overnight trains, and ocean liners (we call 'em cruise ships now). Watson Senior was a Cunard man; opinion in IBM in the late Forties was that they refurbished the Mary mostly to get him back.

And the planes, when they flew at all, flew low. You could see the Canyon, revel in the Alps, look up at Mount Wilson as you came into L.A. Airports were small – you didn't have to walk and walk and walk and walk.

Travel was something fewer people did. There weren't all the spoiled youngsters – just the college kids at Christmas and at term time. There weren't as many of *us*, going back and forth on computer safaris of dubious venue. Travel was something special; something important. You only did it casually if you were rich, or famous. Otherwise, unless it was an emergency, you planned long in advance, and carefully. And the anticipation was fun in itself.

Travelers, business ones especially, were treated well. If you had a bedroom on the Broadway Limited to Chicago, or a seat on TWA Flight 2 nonstop from International overnight – let alone something really exotic like a berth on a transpolar SAS flight – you were an honored customer, almost a guest. An Admiral or an Ambassador got his card for being a VIP, or a very frequent passenger indeed, not just by putting up a few easy bucks.

People on fancy trains, transcontinental buses, airplanes didn't wear gunnysacks, or overalls with sequins, and the heaviest weight mountaineering boots. They didn't lug clothes bags and tennis rackets and gigantic backpacks and guitar cases; not into piston-engine Corvairs, or the Ohio State Limited's roomettes!

Now they do. Now most people travel – welfare cases, little children, potheads, and streams of just plain ordinary men and women who used to stay home. They fill the roads to the airports, the parking lots, the boarding areas, the aisles and the overhead racks and the seats of the planes. They want things cheap. They want no surprises: Holiday Inns and McDonalds, not the Clift, not Christ Cella's.

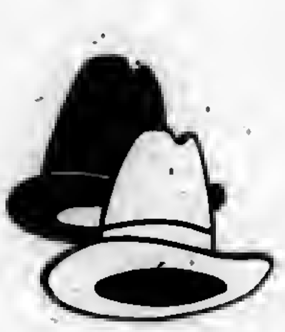
And the airlines and the hotels and the restaurants conform. Once they catered to the sophisticated traveler, the one who would return often, commend expert service, tip generously. The novices, the casuals were to be educated up, shown how to stay at the Waldorf, eat at Chambord, fly Air France. Now, that's all reversed: the experienced traveler, the business executive, the peripatetic scientist is just a statistical fluctuation in a vast mess of undemanding slobs: people who sit unknowingly or numbly while Amtrak or Eastern or the Jack Tar grinds away.

How about a crusade? There isn't a hope in hell of doing much to improve steerage. As long as every high schooler and his great-grandmother flit hither and thither like only movie stars once did, the back of the plane, or bus, or hotel hallway is going to stay crummy. And those of us who get stuck back there will be treated at least as badly as the peasants, and often worse – if we complain, that is.

So my idea is, first class business travel again. Right now it costs about fifty percent additional on the airlines, and not much less to go to really good hotels: maybe forty percent. A great many organizations permit us to use good hotels and eat in the Scandias and Chez Carys already. The main blocks are two: the airline thing, and *per diem*. I suffered under the latter with Uncle Sam, for six years, and it's beastly; not just ridiculously low, and insensitive to the variations from New York to Oshkosh, but plebeian. The GS-6 and GS-16 both sit in squalor: the same squalor!

The airline fare, though, is arguable. Even at current rates, the impossibility of working in cramped economy seats, the expensive meals eaten after landing or before embarkation to avoid the horrid trays In Back, add plenty of invisible expense to the employer's costs. But first class, except to and from Texas, is often nearly empty. If enough business people were permitted to fly up front, the seats could be filled most of the time, and the differential reduced. Suppose it were only twenty or twenty five percent; would your boss let you Fly First? Ask him, and then let your favorite airline or the Airline Passengers Association hear if he says yes.

Perhaps the regulators would let up on First, and allow lines that want to be nice to passengers, like Continental, to experiment with lower rates. Let the pack-'em-in boys ignore first class; they do it poorly anyhow. But for the sake of us veterans, and the poor devils that have to do it often, let's make travel a little more fun!



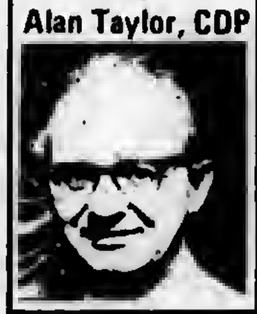
Herb Grosch

Areas Suspected of DP Abuse Require Positive Action

The Taylor Report

By

Alan Taylor, CDP



It is now accepted that computer abuses can occur and many people take considerable trouble to avoid them by making appropriate system changes, file separations and other such actions. These actions may be enough to prevent the actual abuse itself but, unless they are amplified, they will still result in complaints of sufficient regularity that their existence should also be considered.

This may sound like a long story, but anything as powerful as DP must be expected to be feared and, therefore, must keep its skirts superclean. My mail clearly shows there is a continued questioning of all DP and I think that will continue.

One familiar instance is *Computerworld's* subscription solicitations. Year after year, CW uses mail solicitations to gather new subscriptions. These are sent to people who are on various mailing lists, thus opening the door to a possible invasion of privacy situation by using the lists to build dossiers about individuals – so-and-so reads this, is a member of that, holds such-and-such a position, etc.

In fact, although the lists could be used this way, there are precautions taken to ensure they are not so abused. Although CW literature is sent to people on each list, CW itself does not have possession of the lists themselves.

The literature is sent in bulk to a mailing organization which also gets a set of labels and applies them to the subscription cards. This way the comparative examination of information about Person X on lists A and B can't be performed by computer because no one has the computer-readable tapes of both lists.

These tapes remain with the owners of the lists and are not provided to the occasional users of them, such as CW. Therefore, privacy abuses are greatly limited.

Imagine the Rest

You can imagine the rest. Some people are on more than one list and receive more than one copy of the solicitation. And I start getting letters about CW hypocrisy based upon either the waste of trees or the technical incompetence in failing to search all the lists, compare the addresses, identify duplicates, triplicates, quadruplicates, etc. (At least with CW, I have never been sent more than five copies of a single solicitation – with other publications I have received up to 36 copies.)

This year, Margaret Phelan, CW's vice-president/circulation, included in the solicitation package an explanation card stating that while duplications had been removed as much as possible, they could still occur. In some cases, even this explanation was seized on as being proof CW knowingly sends out these duplicate mailings.

"The editors of *Computerworld* have clearly identified themselves with commercialism at the expense of DP professionalism," one director of computer services wrote. A senior systems analyst wrote that a return card indicating multiple mailings are being received could be used as a source document for entry into a preprint edit program before mailings are generated. Other methods have also been suggested, but these are sufficient to give the idea.

However, the correspondents overlooked the following:

- The cards bear different list stamps.
- The labels are printed with different address formats.
- Some computer typefaces are identifiably different.

The list stamps on CW solicitations are usually stamped in red to the left of the address label. Currently, lists are designated as CAM86, CAI86, LOF86, SBD86, RAC86, etc. (You can try working out the codes in use.)

The formats of the labels are even more different. CAI86, for instance, uses a five-line, 29-character format with the Zip Code on line 5 in positions 21-25 and a code identifier on line 2 in positions 24-29. LOF86, while also using a five-line address, has only 25 characters per line, puts its Zip Code in an earlier character position (position 20-24) on the fifth line and has its identifier on line 1, not line 2.

> *Explicit information and an invitation for positive action are logically unnecessary. But they are real actions which can help people who feel threatened by the very potential of abuse and, thus, are a practical necessity when handling abuse-potential situations.*

The other formats are equally identifiable and differ in the number of lines, line lengths and field positions.

Looked at from an insider's point of view, these differences clearly indicate that at no time did one computer file exist for all the addresses. Yet, complaints continue because it is known that in this area there is a definite possibility of abuse.

Therefore, here and in other similar cases where computer abuses have been faced and, for the most part, solved, systems people must continue the positive action and bring the facts before the potential computer victims.

While Phelan's explanation card is clear and to the point, it could have been amplified (perhaps on the back) by explaining how to recognize different prospect lists and why List A was not compared with List B. At the same time, where there is a possibility of duplication, within a single list (as I found in SBD86), an invitation to return these duplicates would have provided positive action.

This additional, explicit information and invitation for positive action are, of course, logically unnecessary. Everyone who complained to me had enough technical knowledge to look at the formats and draw the appropriate conclusions. But the information was overlooked because it is only implicit.

Even within single prospect lists, where unnecessary duplication can and does occur, some real action is possible. Even though CW may only be able to act as a conduit and pass on the duplication information to the actual list owner, providing such a conduit would be a real action.

These points appear to provide guidelines for the systems work involved in handling suspected DP abuse areas. First, solve the abuse problem itself; then provide explicit information and real assistance for action to the people who feel threatened by the potential for abuses. Doing this is a very practical necessity when handling abuse-potential situations.

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Education Part of the Solution

Systems Development Lag Still a Reality in DP World

By Harold W. Worrall
Special to Computerworld

During the early days of DP, the sophistication of hardware lagged behind our ability to develop complex and interrelated applications.

Now the hardware, software and the applications are out of synchronization in the opposite direction. Each day new concepts of "total" systems are visualized and old visions of the same great concepts die.

We're on a wild goose chase. What are the reasons this systems development lag exists and what is the solution?

In discussing the systems development lag, it is important to note the common thread in DP, the implement by which systems are born and die; the human.

Why is it that hardware and software continue to progress in capability and systems applications lag? Software and, in particular, hardware are designed and built without the involvement of the user. Nor is it necessary, practical or beneficial to ask the end user how to design.

System applications, however, *require* the user's input into the design because it's his procedure, process and work activity you are automating and the system is one he will have to use each day.

How wonderful it would be if some one of us was great enough to know it all and design the system without the user, or if we could devise a piece of hardware to do diagnostic checks on a user to see if we are getting correct answers.

But we can't, so a further definition of our problem lies with the current philosophies of systems development.

One of the most pressing problems of the programmer/analyst is keeping current in his field. Modern hardware and software configured around such concepts as data base, teleprocessing and telecommunications affect the way we manage a systems shop, the way we design a system and the way we program it.

Reader Commentary

DPers are in a continuous education cycle and can't get out of it – it's time-consuming, expensive and necessary.

But this education cycle doesn't address the current problem of how to deal with a user in developing a system.

Management Problems

One of the most critical areas of any organization is the management. In my career, I have been associated with many fine managers and some not so fine.

Almost without exception, each poor manager had a heavy technical background and very little real training in the process of management. This general rule has proven valid.

What is the current philosophy in the DP world? We promote the technical man because the rest of us know it's a very difficult field requiring many years' experience and training to understand. The potential pitfalls are many and the consequences severe, so we give the job to the tunnel-visioned expert.

This is wrong! The investment of resources in systems development is huge and requires the expert in management.

Another current philosophy in DP is the schedule – make it and meet it. If the schedule included user testing, user documentation, systems training, user interaction time and implementation planning time, the cost analysis might not be so inaccurate.

Commonly these costs are not included because the user is not sufficiently involved. Even if he were, the person defining the schedule would be a technical man first and a manager second.

The consequences of this philosophy are systems that cost much more than anticipated and take longer to develop or systems that get "up" on time with no documentation and no user support.

The second situation is the worse one, but one would be surprised how many gold stars are handed out on systems that are "up."

There is only one thing worse than not involving the user, and that is forcing him to use a system which he was not involved in developing.

The most significant solution to many of these questions is education – not only the education of the systems people on hardware and software, but the education of top management, middle management and the end user.

The program of education is a continuous and a costly one, but the black box concept must be destroyed. To design a system of the sophistication continually prophesied in systems shops, this objective must be met.

A second suggestion is to promote managers with a DP background rather than DPers with a management background. Don't forget, the best man you're going to get is the one with both technical and managerial capability, but there aren't many.

It should also be a goal to promote people throughout the organization who have an exposure to DP. With the growing complexity of the business and government worlds, it seems inappropriate to promote those who will not make an effort to receive the training.

A third suggestion is to propose and maintain one DP plan. If your organization has decided your DP plan centers around the modular development of a complete information system for your organization and your divisions, districts, and/or suboffices are free to develop systems outside of that plan, you're in trouble.

Two offices can spend money faster than one and, when you're through, it will not be possible to interface the systems.

A fourth suggestion is to bite off a "reasonably" sized project from the complete system plan. The complete system concept is a part of the planning world, not the real world. By the time the complete system is done, it will be time to start over again.

A final suggestion that many will reject immediately is to select a middle management employee to act in the capacity of a project leader for a specific system development.

This suggestion assumes this individual is heavily trained in systems and in the specific hardware/software configuration with which he will have to deal. Accountability must accompany that responsibility.

Worrall is with Envirotech Corp. in Salt Lake City, Utah.

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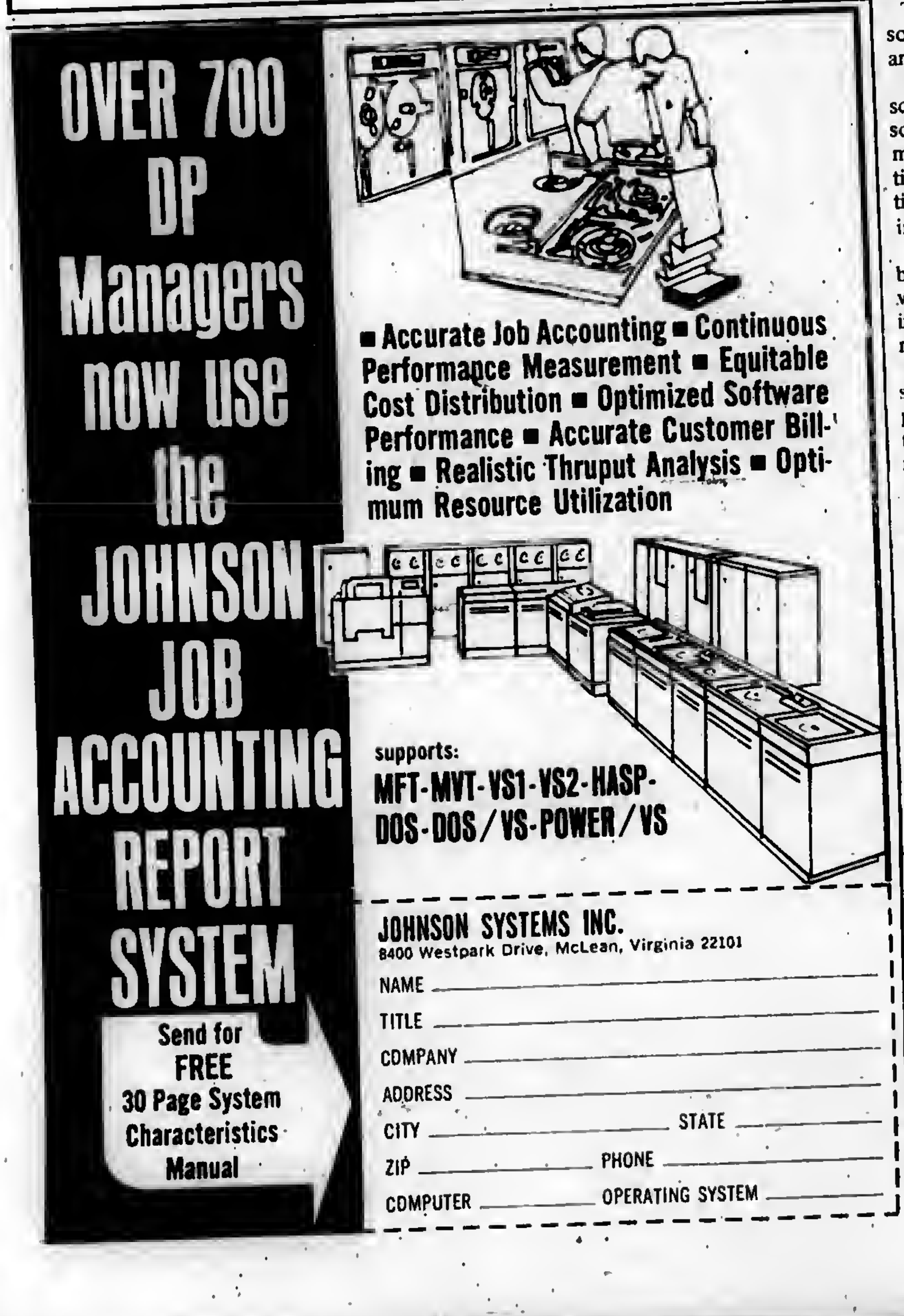

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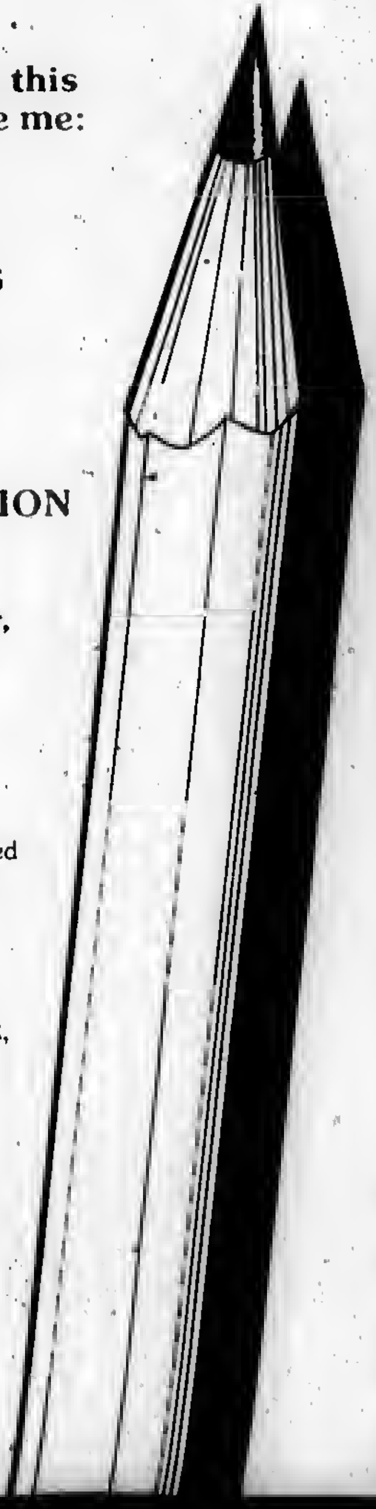

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Manufacturer's Staff Adapts IBM's 'Ipics' to S/32

By Kent E. Milnes
Special to Computerworld

CTS Microelectronics, Inc. of West Lafayette, Ind., a subsidiary of CTS Corp., has modified and installed IBM's Initial Production and Inventory Control Software (Ipics) package on IBM's smallest general business computer, the System 32.

This disproved the myth that a large, expensive computer is necessary to run a sophisticated computerized production and inventory control system.

The software package was modified by experienced DP personnel at the corporate level, but was installed and is maintained by a young business school graduate with manufacturing systems experience who did not have previous DP experience.

This dispelled a second myth – that smaller manufacturing companies must hire and be at the mercy of experienced programmers who often know little about the actual operations of the company for which they work.

A System 32 was delivered to CTS Microelectronics last December. By June, the applications of bill of material processing, inventory accounting and material requirements planning were operational.

These applications are modified versions of the Ipics packages which were designed to run on the larger and more expensive IBM 3.

CTS Corp. is extremely decentralized; there are 18 nearly autonomous operating facilities in widely scattered geographic locations. The interest in computer information systems at CTS increased in July 1975, when management recognized the economic potential of combining improved manufacturing software with lower cost hardware.

To investigate the use of decentralized small computers, e task force was organized. The objective was to determine the feasibility of installing low-cost computers and developing a set of specifications for these systems.

A quick survey of CTS companies which would be considered as candidates for low-cost computers revealed the following list of specifications:

- Hardware considerations dictated:
  (1) Disk capacity ranging from 7M bytes to 50M bytes.
  (2) Memory ranging from 16K to 48K.
  (3) A line printer with a minimum speed of 300 line/min.
  (4) Optional teleprocessing capability.
  (5) Inquiry terminals (desirable but not mandatory).
  (6) The potential for hardware enhancements with a minimum of software changes.
- Excellent hardware reliability was required by production management.
- A high-level language was needed to reduce development time, expense and the requirement for highly skilled technical programmers. A software package providing basic production and inventory control techniques was necessary to reduce these direct and indirect costs still further.
- A basic Production and Inventory Control System (Pics) package was needed which could satisfy the requirements of all 18 CTS companies.
- Both the high-level language and the Pics package had to be compatible at the source level over the complete range of hardware.
- It was highly desirable that the total monthly rental and maintenance costs at the smaller CTS facilities not exceed $2,500.

After soliciting bids from all known manufacturers of low-cost computers, we concluded the IBM line from the System 32 through the 3 would provide the hardware capabilities required.

The 300 line/min print requirement was relaxed and a system software requirement for error exception reporting to reduce print volume was emphasized. Strong preference was given to the System 32 whenever possible because of its price/performance.

The requirement for hardware serviceability coupled with the remote location of many of the CTS manufacturing plants led to the selection of IBM as a vendor. If the plants were located in or near large metropolitan areas, another vendor may have been selected.

Many high-level languages were acceptable including RPG-II, the language used by the IBM product line.

Ipics, with the four announced modules for engineering and production data control, product costing, inventory accounting and material requirement planning (production control and capacity planning modules have since been announced), did not cover all the necessary requirements, but it appeared to be a good starting point.

Although IBM literature did not state Ipics could be installed on the System 32, there were no obvious restrictions.

At this point, the apparent solution for most locations was the System 32 using RPG-II and Ipics. The system was justified for the first plant site and several IBM contacts were made to discuss the order.

Initially, IBM sales representatives were not supportive. They explained that the obvious alternatives were the Ipics modules on the 3/8 or the MMAS packages on the System 32. To choose outside these alternatives was not recommended.

A further analysis indicated potential problems with Ipics on the System 32 might be the nonremovable disk, which could cause backup problems, and the slow printer, which could be inadequate for Ipics output.

In actual practice, CTS personnel found backup takes only 30 minutes each week with the System 32. Most report printing can be accomplished on an exception basis, eliminating long print jobs. When long reports are necessary, they can be printed during the night.

Milnes is director of corporate planning at CTS Corp., Elkhart, Ind.

'Natural' Links Between User, System Seen Replacing Programmers in Future

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. – The day is coming when applications programmers won't be needed anymore . . . at least not to write code for specific jobs or problems as they do today.

Instead, these computer specialists will be responsible for identifying or facilitating the "natural interfaces" that will then exist between systems and their users, according to Frederick B. Thompson, professor of applied science and philosophy at the California Institute of Technology and a speaker at a recent conference here.

These natural interfaces – dependent chiefly on language and graphics – will permit users to write their own applications, Thompson said.

The second future responsibility facing the applications programmer will be the organization of data and the relationships between the algorithms that will manipulate that data, Thompson said.

Finally, the applications programmer will be responsible for organizing the devices to which the user will be attached in "writing" and executing the jobs he needs to do.

Thompson's vision relies on the notion that English and other "natural" languages will be the means users and programmers alike employ to communicate with systems.

Some systems are English-based already, he noted, adding thus far the use of natural languages works well where the subject matter is limited – as in the use of the block movement system to build a bridge or in the analysis of lunar rock material.

Because the understanding of the English sentence depends very much on context, the language is manageable in a computer system where subject matter, and thus context, is restricted, he noted.

But Thompson maintained large-scale use of English for a variety of applications is possible if the substantive words in the language are programmed separately from the function or little words like "a," "an" and "the" and from syntactic mechanisms such as the function of a pronoun in a sentence.

Thompson sees a movement toward the use of English and graphics and away from application-specific programming in part because he doesn't believe the promises of "hardware types" that partitions won't be necessary when improvements in memory size and access time have been improved by an order of magnitude each.

Thompson also foresees some functions being carried out by microprocessors that form part of the hardware rather than by the code that is written today.

The definitions of what is software or firmware or hardware will change over time for the same program, he explained, emphasizing the notion that more software will be provided through hardware.

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Institute Source Reacts

Stevens Gave 'Flavor' of Software Physics, But...

By Roger P. Novach
Special to Computerworld

First, let me say that I am a senior consultant on the staff of the Institute for Software Engineering [founded by Ken Kolence to provide a center for the development and teaching of software physics]. This will enable readers to make allowances for my bias.

Second, the following remarks are my own, not Ken Kolence's or any sort of "official" commentary by the institute.

Lastly, I would like to say I truly admire the way Barry Stevens was able to keep an even keel [CW, Sept. 20] in spite of the fierce crosswinds from ardent supporters and vehement opponents. Given the very severe limitation of space, he did a fine job in communicating the flavor of a very different approach to explaining a familiar, if complex, set of phenomena.

Now for the "buts" and "howevers" . . .

First, a couple of items in the exposition of software physics need adjustment or amplification (partly because of some typographical accidents). I will start with the whole set of concepts surrounding work, software work vectors, power and the popular SMF-based reporting and billing packages.

Change in State

Work is done when a change in state occurs (this is straight physics). In this case, in practical terms, a *unit of work* is performed when a *byte is transferred* (written) *to* a storage medium by a processor for a software unit.

A full workload or any mentally separable part of it may be characterized by a vector whose entries are the *work* done by each system component in executing that workload.

The system components may be any reasonable partition of the full system such as equipment classes (CPU, tapes, disks, etc.) or subconfigurations (CPU, chan 0 configuration, chan 1 configuration, . . .) or groupings of subconfigurations (CPU, byte multiplexer configuration, selector channel configurations, block multiplexer configurations, . . .) or what have you.

I have gone over this ground because the illustrative array in Stevens' article may be misleading. The first column is headed "SEC CPU" which would be a time measure, not work.

Most readers would assume the other columns are I/O counts (EXCPs). They should be units of work. Work is fundamental – and primary.

Because present instrumentation limits our ability to directly measure CPU work for a subworkload and present recording methods do not keep accurate totals on I/O work by subworkload, it is necessary to resort to estimating and approximating techniques in practical situations.

One way to do this is to measure (with a hardware monitor, for example) the power of the CPU on some typical full workload and then use the fact that

WORK = POWER X TIME

to estimate from CPU time the work done by the CPU for some software unit. The same thing can be done with block sizes and EXCPs.

Keeping all these qualifications in mind then, the polynomial and the discussion of the Boeing and Value packages follows. If it were possible to directly measure work, then the story would be completely different.

I know this sounds like caviling, but if we do not keep our thinking about fundamentals clear and precise, then we will find ourselves back in the foggy thicket again.

One more nit: the capability to do work is energy. Power is how much work can be done in a given time. Power is the capacity to do work.

Anything New?

One other large issue which was very distressing to me as a general intellectual problem was the muddy discussion of whether software physics "contains anything new." It revealed a very poor understanding of the nature of theory construction and the role of theory in the development of any field, especially one with practical applications.

Stevens' remark ("But software physics provides a method . . . And *that* is new to DP.") is right on target – and, in fact, could have been generalized.

By the logic of the remarks cited, Newton's mechanics "contained nothing new." It did not change any of the standard observations or measures of mass and motion – nothing in the world or in common practice was changed.

All Newton did was analytically arrive at a few postulates ("laws of motion") about an idealized universe (remember that you always had to "ignore friction"), tossed in a few logical fictions (force operating at a distance) and more or less redescribed what everybody already knew. What's new?

And yet the poet wrote, "And God said: 'Let Newton be,' and all was light."

Some slightly unfortunate syntax made it seem that Dan Momjian is saying software physics is some kind of cost allocation scheme. One application of software physics is providing a sound basis for cost accounting and billing in DP.

Space is too short to enter into a proper discussion of time, processing delays, turnaround time and service levels. It is my belief that both Stevens and Kolence are right. I think that these matters have not yet been covered in the developed work in software physics.

I also believe they can be handled by natural, straightforward software physics methods based on the existing definitions and present work on time.

Correction

In "'Software Physics' Standardizes DP Operations" [CW, Sept. 20], the fourth column should have started with the line reading "data from one storage type to another" in the fifth paragraph of that column.

The text from there to the bottom of the page should have been followed by all the text that appeared at the top of the column.

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William E. Linn — Dr. Linn is a member of the Cullinane Corporation Senior Technical Staff. His responsibilities include IDMS training, database consulting and technical marketing support. He was previously with Southern Railway System in Atlanta where he was deeply involved with database administration activities with IDMS. He has his Ph.D. in Computer Science from the University of Michigan and has been associated with the Georgia Institute of Technology teaching data structures and list processing techniques.

Raymond J. Nawara — Mr. Nawara is Southwest/Plains Area Manager of Cullinane Corporation. He has had extensive experience with the design of health and patient-care systems. Previously he was the Data Base Administrator at the Health and Hospitals Governing Commission of Cook County, Illinois where he had extensive experience using IMS. He has consulted in Database Applications for a variety of clients. Mr. Nawara is a graduate of the University of Houston with a major in Mathematics and Computer Sciences.

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Status of Women on DP Staffs? Survey Could Give Hard Facts

By Jack Stone

Special to Computerworld

The Human Connection

Dear Jack:

I have been disappointed you have not discussed a subject clearly of vital concern to many readers: the long-existing discriminatory practices by American organizations against women in skilled jobs, particularly in computing centers.

It was as an executive secretary to the president of a small computer services firm that I learned of what I believe to be unfair personnel practices in the industry. But like many other women in business, I felt my livelihood was in jeopardy and I did not speak out at the time.

Now, gratefully, times have changed much for the better. Not only are more Americans supporting the rights of women, but the Federal government has taken an active role in supporting women workers.

I strongly recommend as required reading for women in the industry "'. . . To Form a More Perfect Union . . .' – Justice for American Women," a report of the National Commission on the Observance of International Women's Year (U.S. Government Printing Office, Washington, D.C. 20402, June 1976, $5.20).

Recommendations of the commission that I feel particularly relevant to DP jobs for women are those contained in the section entitled "Upward Mobility for Secretaries."

These recommendations include:

- Secretarial jobs should be viewed as a major access route to DP professional and technical jobs, as well as a career in itself.
- Information on DP job opportunities as well as training programs for entry-level DP positions should be made available to secretaries at all levels.
- Administrative supervisors should be involved in the career development programs for each member of the staff and should be carefully trained to evaluate individuals in terms of acquired skills and past performance – not in terms of previous job titles.
- The prime source of talent for filling entry-level vacancies in DP professional and technical jobs should be current employees.

I would be interested in your views regarding programs in the computer center environment to develop and transfer women members of the secretarial and administrative staffs for professional and technical positions.

Sandra H. Cunningham
Washington, D.C.

* * *

Dear Sandra:

Because of the complexity of issues raised in your letter, I'd like to comment on it and invite our readership to take part in a survey (see box) intended to provide current data on the progress of women toward DP professional/technical positions.

Obviously the more survey responses the better, but in any case I'll tabulate and analyze whatever replies come in and report my findings in a later column.

I believe the presence of women in DP slots is widely accepted, probably more so than in any other professional segment of the American industrial society. In this sense, I don't support the charge that computer center hiring and promotional policies are discriminatory.

However, I agree with you that secretarial jobs are rarely steppingstones to DP careers. The reason is simply an economic one in the minds of the managers – it's cheaper to hire experienced professionals from the outside than train non-DP people from the inside; no significant weight is given to the value of increased commitment and morale from on-board people or the costs involved with discharging the experienced new employee who doesn't work out.

There are, of course, exceptions. A small percentage of centers is looking at programs to upgrade administrative personnel to satisfy Equal Employment Opportunity regulations as the centers interpret them.

More to the point, the overall participation of women as professional/technical computer center employees is well below 50%, the obvious ultimate goal. I would estimate about 12% of the total DP jobs

(Continued on Page 23)

What's Your Situation?

Within your DP organization, how many men and women are within each of these categories?

	Men	Women
Management (second level up)	______	______
Supervisors (first level)	______	______
Technical/Professional	______	______
Operators/Others	______	______
Secretarial/Administrative	______	______

Do you feel your organization discriminates against women in the hiring, transfer, selection or promotion of DP positions?

Yes ______ No______

Do you feel the secretarial staff is a viable source of personnel for junior DP positions?

Yes______ No______

Are you: Male?____ Female?____ College Graduate? _____
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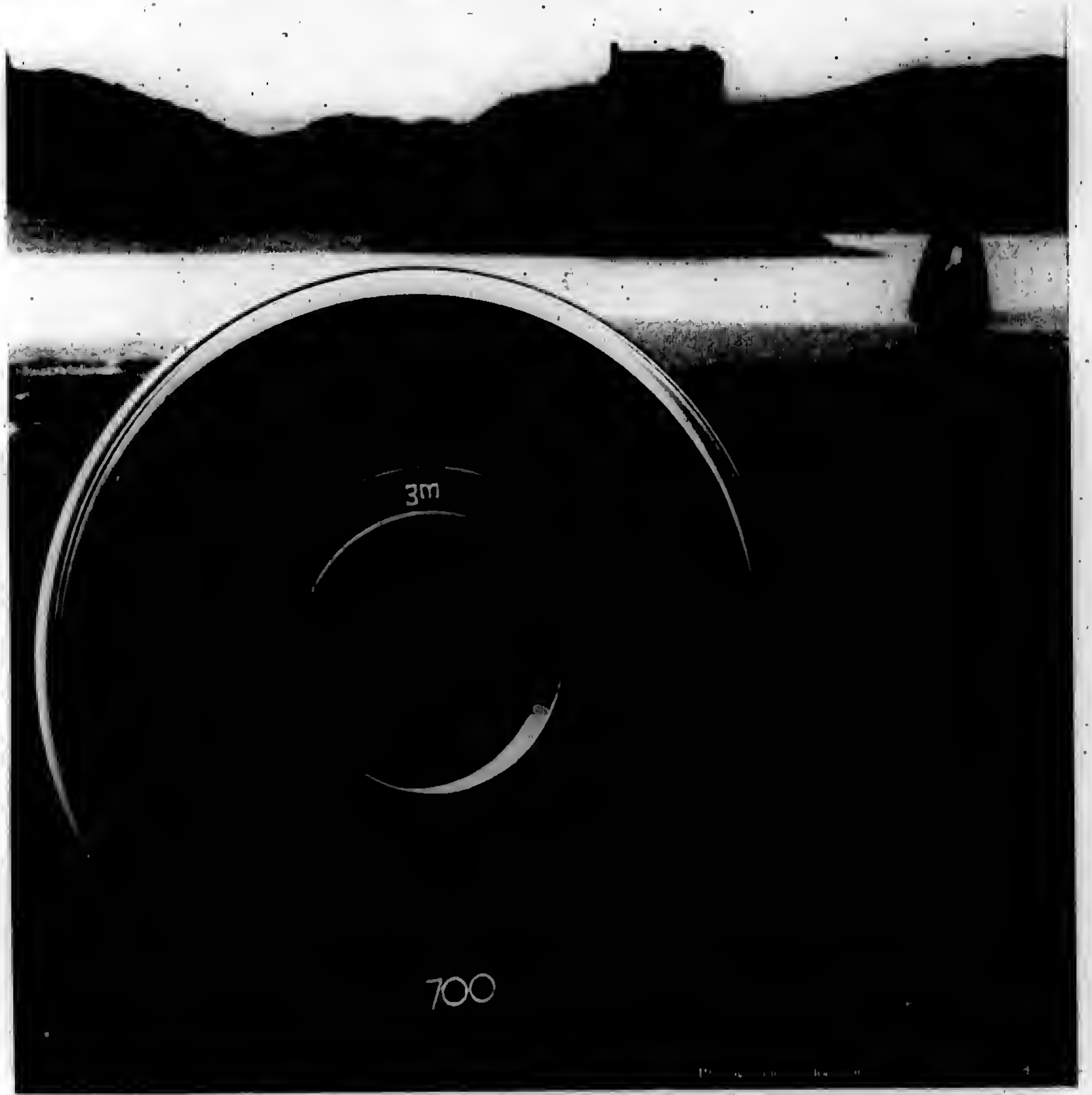

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Software Engineering Ideas 'Well-Rooted in Math'

By Edith Holmes
Of the CW Staff

Concepts and Techniques

WASHINGTON, D.C. – A debate on the pros and cons of software engineering? Why, that's like a debate on apple pie!

So said J. Robert Wood of IBM's Federal Systems Division, who chaired the proceeding at a recent conference here.

It's as hard to hate all versions of the idea of applying discipline to the creation of software as it is to dislike all forms of the American dessert. Both encompass a variety of approaches, and these require some definition and clarification now and then, Wood said.

Accordingly, Harlan D. Mills of IBM and Barry DeRose of the U.S. Secretary of Defense's Office squared off to explore the issues.

For Mills, software engineering isn't hard enough. "There's a difference between using the names for it and employing the ideas behind it," he said.

The "ideas" Mills advocates are "well-rooted in mathematics" and are intended to be guards against the faulty reasoning he said occurs so often in the development, design and writing of software.

"We've only had 25 years of software building. That's a terribly short time for any human endeavor," he said.

"Most of today's software practitioners didn't learn software engineering in school. But while it's important to recognize we're doing something that is difficult and that has only been practiced for a short time, we have many people doing it badly."

Calling the learning of software engineering "a tough mental proposition," Mills suggested the only way to become proficient in its concepts is to use them. "We need more rigor now to make programming easier in the long run," he said.

"A systematic approach to stepwise development and design will produce programs that will run," he stated. "The universities are now turning out people who program effortlessly and flawlessly."

Software engineering will get easier in the next 10 to 15 years, Mills predicted.

Everyone agrees the writing of software requires more discipline, especially in requirements analysis and in the involvement of the user in a program throughout its creation, DeRose said.

What concerns him is the term "software engineering" itself. By calling this discipline "software" engineering, "we dichotomize software from hardware as if they don't go together," DeRose stated.

"We imply they can be separated and treated differently, especially when we're talking to top management," he added, suggesting "systems engineering" might be a more useful term.

But any of these terms carries with it the problems inherent in using "buzz words," DeRose said. "They look good on viewgraphs; they make it look like we're up with the state of the art and all that jazz."

They impress top management, he added, and "it has taken me a long time to convince my own management in the Department of Defense of the danger of these terms.

"Today, if someone says 'software' to the Secretary of Defense, he almost has a heart attack," DeRose said, noting he prefers this response to a reaction indicating his management perceives software or its engineering as a panacea for problems.

Like Mills, DeRose said he believes "we need to begin to do what the term 'software engineering' implies we do. We are beginning to know now how to put discipline and rigor into software engineering.".

The question for the future, he added, is: "When have we had enough? When do we stop?"

Census Data Bases Aid EEO Reporting

MONTVALE, N.J. – Information Science Inc. (Insci) is now marketing customized statistical data bases extracted from 1970 Census figures on external labor markets to be used in conjunction with the company's Expanded EEO Compliance System.

The data bases, developed by Kellex Data Services, provide comparative information so a using company can demonstrate the degree of its compliance with the federal Equal Employment Opportunity (EEO) requirements, Insci said.

Since users only need data for labor markets in which they have locations or to which they are considering a move, the cost of the Kellex data base varies, Insci said from 95 Chestnut Ridge Road, Montvale, N.J. 07645.

Survey May Suggest Role of Women in DP

(Continued from Page 22)

are held by women (though I know of one particular very large operations center which has a nearly 100% female staff).

Another note is that of the 400 or so people in the dozen DP management and technical classes I have produced or taught this year, only 3% were women. My conclusion is that DP management has increased the selection of women over the years, although it has generally not implemented aggressive training and development programs to accelerate progress.

Responses to the accompanying questionnaire will provide some reasonably hard facts about the ratios of men and women in different job groupings if the respondents are as accurate as they can be.

The information for any specific installation will be kept confidential; we ask installation identification simply to avoid including any shop more than once in our analysis.

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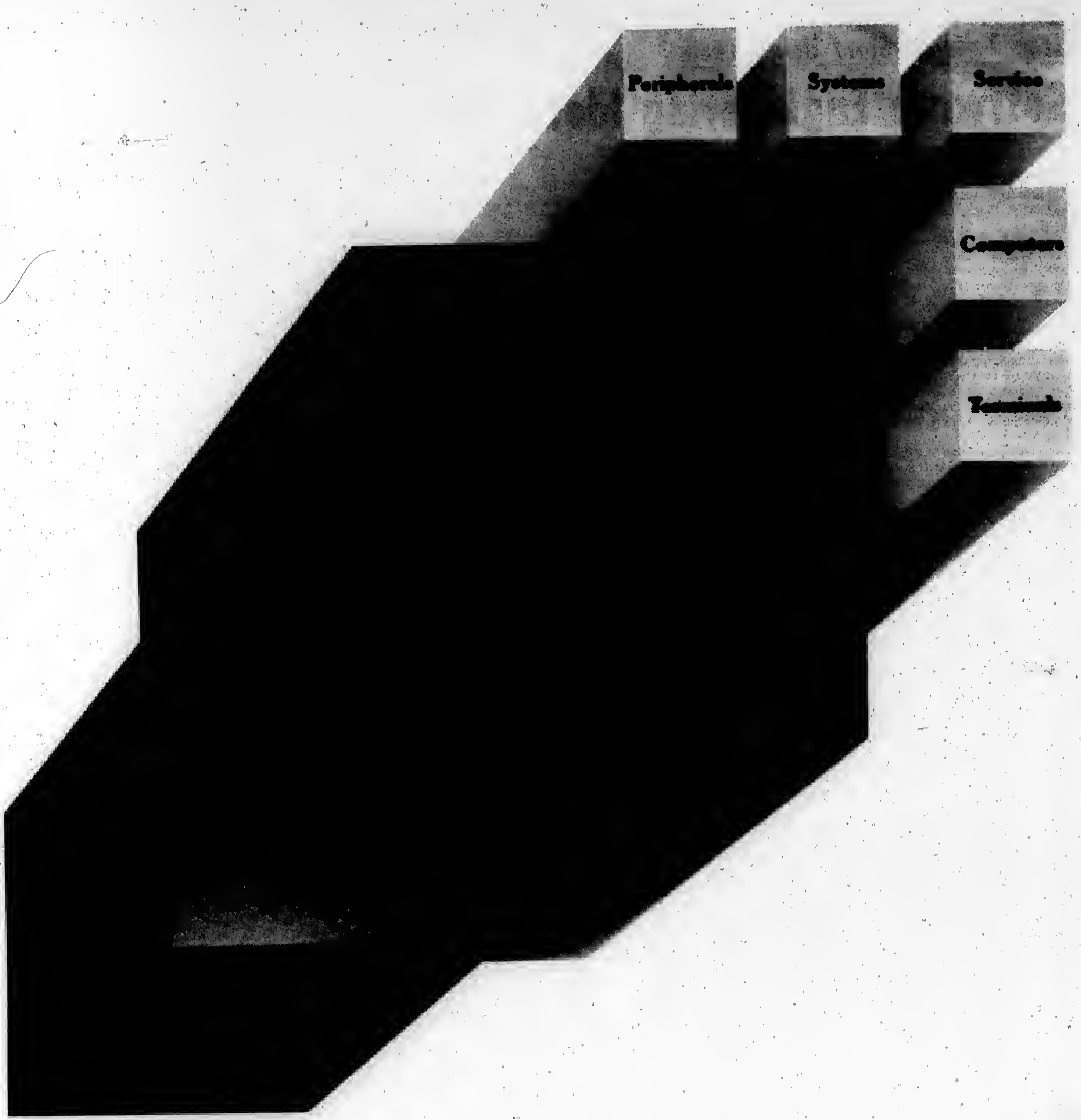

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Data Briefs

Digi-Log Line Monitor Diagnoses Net Malfunctions

HORSHAM, Pa. – The DLM II from Digi-Log Systems, Inc. is a line monitor for isolating and diagnosing data communications network malfunctions, according to the vendor.

The device displays the data characters and the control characters that flow on a transmission line on a CRT screen, enabling the user to spot problems as they occur and identify the cause, the company said.

Three major applications areas for the DLM II include network control centers; workbench testing of hardware and software; and at field service or remote sites, a spokesman added.

Problems with transmission lines carrying data at up to 9,600 bit/sec rates can be viewed on a 640- or 1,280-character CRT screen, he said.

The tester has the capability to address a variety of codes and protocols such as synchronous, asynchronous, bisynchronous and Teletype, the vendor noted.

The DLM II is available for immediate delivery and costs $2,495. Digi-Log is at Babylon Road, Horsham, Pa. 19044.

Prentice Has Synchronous Modem

PALO ALTO, Calif. – Prentice Corp. has introduced a full- or half-duplex 2,400 bit/sec synchronous modem for transmission over common carrier leased lines and dedicated transmission lines.

The P-201B modem operates in the same system configuration as Bell 201B data sets, the company claimed.

An LED display monitors the status of key data control signals. The unit includes facilities for both line and data loopback testing, Prentice said.

The P-201B has an RS-232C interface and all Bell 201B options are standard or strap selectable on the Prentice model.

The basic P-201B costs $625 from Prentice at 795 San Antonio Road, Palo Alto, Calif. 94303.

LDS Reduces Modem Price by $945

LIVERMORE, Calif. – Livermore Data Systems, Inc. (LDS) has reduced the price of its MOS/LSI 440/48 modem by $945.

The single-card device is a true 4,800 bit/sec modem although it is capable of split-streaming two 2,400 bit/sec lines, according to a spokesman.

The 440/48 is intended for full-duplex, synchronous data transmission and was designed for point-to-point networks.

The modem is priced at $1,995, the spokesman noted from 2050 Research Drive, Livermore, Calif. 94550.

Data 100 Upgrades, Enhances Model 77

By John P. Hebert
Of the CW Staff

MINNETONKA, Minn. – Data 100 Corp. has upgraded the communication capabilities of its Model 77 key-to-diskette data entry system and has enhanced the system to include concurrent data entry and line-to-print facilities.

The Model 77 Communication System is said to incorporate full batch communications and data entry features and utilize removable diskette storage.

Depending on the system configuration and options selected, communications features provide the ability to send entry data or receive card data, print files and system programs while entry operations continue, the company said.

The Model 77 will communicate with any mainframe operating system which is compatible with the IBM 3780 binary synchronous communication (BSC) discipline, according to a spokesman. It is scheduled to include IBM's Synchronous Data Link Control next year, he noted.

The 3780 discipline supports peripheral data streams using a nonmultileaving mode in a CPU-to-terminal or terminal-to-terminal configuration, he said. The system supports the standard 3780 space-compression scheme and allows transmission of Ebcdic codes in transparent or nontransparent modes through the Model 77's 3780 emulator, he added.

Data 100 Model 77 Key-to-Diskette System

Communications features available on the Model 77 include point-to-point or multipoint transmission, RS-232 capabilities and 2,000- to 9,600 bit/sec communications facilities.

The system communicates over dial-up or dedicated, two-wire or four-wire lines and has auto-answer capabilities, according to the firm.

Enhanced communications features over Data 100's initial Model 77 [CW, Dec. 3] include an upgrade from 4,800 bit/sec transmission speeds and the addition of dual-modem switches and modem-pair simulators and data compactors, the firm noted.

Data Entry Features

Data entry features allow the user to enter, edit and store data on diskettes under control of preprogrammed data entry software using one or two entry stations, the spokesman indicated.

Traditional field edit features are enhanced with fixed entry validation, accumulators, arithmetic functions and I/O formatting, he noted.

After generation and entry of appropriate formats on the system, application data may be entered from the keystations under format control and stored on diskettes in identifiable batches.

The entry station features a movable keyboard. The system's CRT monitor displays characters in 8 lines of 32 positions each for a total of 256 characters.

The Model 77 comes with two diskette drives and can accommodate up to three. The number of drives required depends on the number of entry stations (one or two) in the system, he said.

The unit uses IBM media-compatible diskettes and each diskette contains over 250K bytes of data on 77 tracks.

A basic Model 77 with communications capabilities, two diskettes, a single keystation, the local forms feature and a 62 line/min printer costs $570/mo on a one-year lease including maintenance. It can be purchased for $19,320, the spokesman said.

Price for the second keystation with a third diskette drive is $660/mo or $22,344, he added.

First shipments of the Model 77 are scheduled for November, the spokesman said from 6110 Blue Circle Drive, Minnetonka, Minn. 55343.

Food Supplier Develops Network

By a CW Staff Writer

CHICAGO – A distributor of "fast foods" here developed a computer terminal network to maintain tight control over inventory and product distribution from regional distribution centers in the U.S. and Canada.

The Martin Brower Co. needs quick turnover of the goods it supplies fast food chains from its 20 product distribution centers.

Time constraints require Martin Brower to take an order, process it and deliver the merchandise requested in three days' time, according to Jim Eckberg, DP manager of the company's management information systems.

Although the firm had only Western Union TWXs prior to 1968, the growth in the food industry demanded equipment upgrades through various computer terminals including Data 100 Corp. models and Comdata Corp. units since 1968.

The food supplier presently has an IBM 3741 CRT and an IBM 3717 printer in each regional distribution center where orders are taken and at the main office here, Eckberg said.

Order information is taken over the phone at the regional centers. They are transmitted in batch mode through Bell 201C modems and Bell dial-up lines at 2,400 bit/sec to a 240K-byte IBM 370/135 host CPU here with four spindles of IBM 3330 disk and five IBM 3420 Model 3 tape drives, he said.

The information is stored for later use in inventory control, purchasing of goods and customer service records, although that same night, the CPU prints out invoices at the printer terminal of the proper distribution center.

The 370 CPU contains all information pertaining to the layout of every regional center, where products are stored in those warehouses.

The volume of items and the total weight of the order are also calculated to aid regional center employees at the time of loading.

Order quantities for the individual outlets range from 80 to 300 cases with the product mix including frozen refrigerated and dry goods.

This represents a daily average of over 1,200 orders with over 30 detail items per order – or about 3.6 million characters transmitted each day over the network, Eckberg said.

Net News Needed

A special report on data communications networks will appear in *Computerworld* on Nov. 29.

The report will focus on network configurations and applications as they apply to data communications users.

Articles in the report will contain details of equipment, carrier services, protocols, teleprocessing software, etc.

Readers who would like to contribute articles to this report should contact Ronald A. Frank at CW to discuss story ideas. Articles should not exceed 1,200 words (about four double-spaced typed pages) and are due by Oct. 14.

A new Recorder to talk about

We'd like to introduce you to our great new cassette data recorder, the AJ 730. You can use the AJ 730 off-line to edit or store information; on-line to communicate to remote computers or terminals, or in a network of data communication devices including other AJ 730's.

The AJ 730 can accommodate a number of different terminals, line speeds, and protocols *automatically*. With it you can interface with any ASCII, EBCD, or Correspondence terminal or computer.

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For IBM, CMC Gear

Pertec Introduces Telebatch Capability

MARINA DEL REY, Calif. – The CMC Division of Pertec Corp. has introduced the Telebatch communications capability for the CMC 1800 key processing system.

Telebatch communications capability is provided only through utilization of both CMC System 1802A software and CMC communications controllers, according to a spokesman.

The capability enables 1800 processing systems to communicate with one another or with IBM 360 and 370 series mainframes and with IBM 2780 or 3741 terminal equipment over a dial-up switched network or dedicated line, he said.

Bisynchronous communications (BSC) protocol simulating 2780 card entry allows transmission from local disk or magnetic tape to 360 and 370 systems, CMC noted. Data receipt from other key processing systems or IBM mainframes is also accomplished by simulating the 2780, the company added.

To achieve data transmission rates up to 4,800 bit/sec, a CMC Model 1455 communications controller is necessary, the spokesman noted. The 1802A software is included at no extra charge, he said.

Telebatch BSC rates for the 1800 system range up to 19.2K bit/sec. However, a CMC Model 1456 controller in addition to the Model 1455 is necessary to effect the speeds at the higher end, the spokesman said.

An RS-232C interface is standard and utilizes Bell 201A modems or their equivalent. An optional eight-bit transparency code is available for remote job entry, while an Ebcdic code is standard with the 1802A, CMC said.

Standard 400-byte 2780-compatible buffers are expandable to 976 bytes to perform data compression of strings, the spokesman added.

A resource allocator has also been added to the 1802A operating system to enable users to partition core at tape load time, the company said.

The Telebatch capability costs $3,300 for transmission rates up to 4,800 bit/sec, including maintenance and a 1455 controller. For an additional $1,200 – covering the cost of the 1456 hardware – the higher speeds can be achieved, the spokesman noted.

The CMC Division of Pertec is located at 2500 Walnut Ave., Marina Del Rey, Calif. 90291.

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If the personal penalties for management violation of the Employee Retirement Income Security Act of 1974 have you worried, then take heart.

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For more on ERISA, call Joe Nestor (617) 851-4111, Wang Laboratories, Tewksbury, MA. 01876. In California, call Carl Tarascio (714) 631-0138.

WANG

Coastal Has 'Smart Clock'

MIAMI – The "Smart Clock" from Coastal Data Services, Inc. is a microprocessor-based badge reader/data collection and communications terminal.

It is intended for time and attendance, inventory control and job cost reporting applications, a spokesman said.

The terminal can operate in either on-line or stand-alone mode. Data is relayed to the host processor in Ascii, asynchronous mode through an RS-232C, 20mA current loop or built-in 600 bit/in modem interface, according to the spokesman.

In the stand-alone mode, the device collects information independent of the host CPU. Typically, a day's worth of data can be transmitted to the host in a few minutes, the company claimed.

The Smart Clock reads up to 16-digit codes from standard 80-column Hollerith punch cards, according to the spokesman.

Standard features include 1.7K bytes of factory programmed read-only memory (ROM) and 2K of memory for data storage, although 14K of memory storage is available, he added.

The terminal reportedly checks each transaction for validity and signals the user if a transaction was valid or void through the utilization of indicators and an audible alarm.

Prices for the terminal start at $1,800 for the interface, 1.7K ROM and 2K of storage and go up to $3,100 with the addition of 14K storage memory, and 22-digit number reading capability, the spokesman said from 1592 N.W. 159 St., Miami, Fla. 33169.

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Terminal Transactions

CRT Net Cuts Firm's Paperwork, Saves $30,000/Year

DALLAS – Being "bogged down with paperwork" has its benefits – it forced a large cement supplier here to install a computerized data collection/order entry terminal system that reportedly saves the firm $30,000/year.

"We had to have something" to alleviate the amount of clerical time and errors that caused delays in billing, according to a General Portland, Inc. spokesman.

The stages of bill preparation were so numerous and behind schedule that "the paperwork was killing us" – even though Teletype Corp. Model 28s were helping to speed up the billing transaction process, the spokesman said.

After studying the problem "for a long time," General Portland installed a Sanders Associates, Inc. 810 dual minicomputer-based CRT terminal system to help prevent lost documents, reduce clerical errors and ensure on-time billing, he said.

The system enables personnel at General Portland's Trinity Division here to retrieve remotely stored computer records from the headquarters office five miles away and display them on Sanders 810 CRT terminals for processing.

About 3,000 transactions are handled by the terminal system each day, he noted.

An 810 minicomputer controller is located at both headquarters and the division here. These controllers handle a total of eight 810 CRTs and two Sanders 88 char./sec printers, the spokesman said.

Sanders 810 CRT serves as console for Burroughs CPU at General Portland, Inc. headquarters.

The division's system operates on-line to headquarters' Burroughs Corp. B3700 with 250K bytes of core, six 1,600 bit/in. tape drives, two spindles of double density disk and two modules of head-per-track disk.

The 810 terminals are programmed to emulate the Burroughs TD820 CRT using a software package developed by Sanders. A Burroughs standard language is used to generate the communications handler, he explained.

One 810 system with two CRTs is "direct connected" to the B3700 through a Burroughs standard synchronous adapter at 9,600 bit/sec. No modems are used as the 810 controller supplies the clock, he noted.

Other CRTs are utilized for auxiliary computer console functions and to design and test CRT formats and programs.

The other 810 controller with six CRTs and both 88 char./sec printers is connected to the B3700 through a Bell-supplied private data circuit between the DP center and the Trinity Division, according to the spokesman.

This dedicated line is anchored on both ends by ICC/Milgo Corp. 5500/96 modems operating at 9,600 bit/sec, he added.

The system has taken a considerable load off the central processor, according to Jon Dell'Antonia, director of General Portland's Management Information Systems.

"Our programming is such that all 'must fill' fields have to be completed before the information is sent to the CPU. This eliminates sending all the information to the B3700 and then having to send it back for corrections or inserts," he said.

The company manufactures cement at eight plants in the U.S. When an order is received at the Trinity Division, the customer's number is typed on the keyboard of the display terminals which are on-line to the remote computer at headquarters, Dell'Antonia explained.

The system communicates the customer number, product number, quantity, how it will be shipped and other pertinent data to the terminal for display.

A clerk then types in the delivery schedule and sends all the information back to the computer which automatically generates an order and prints out a bill of lading at the division office, he said.

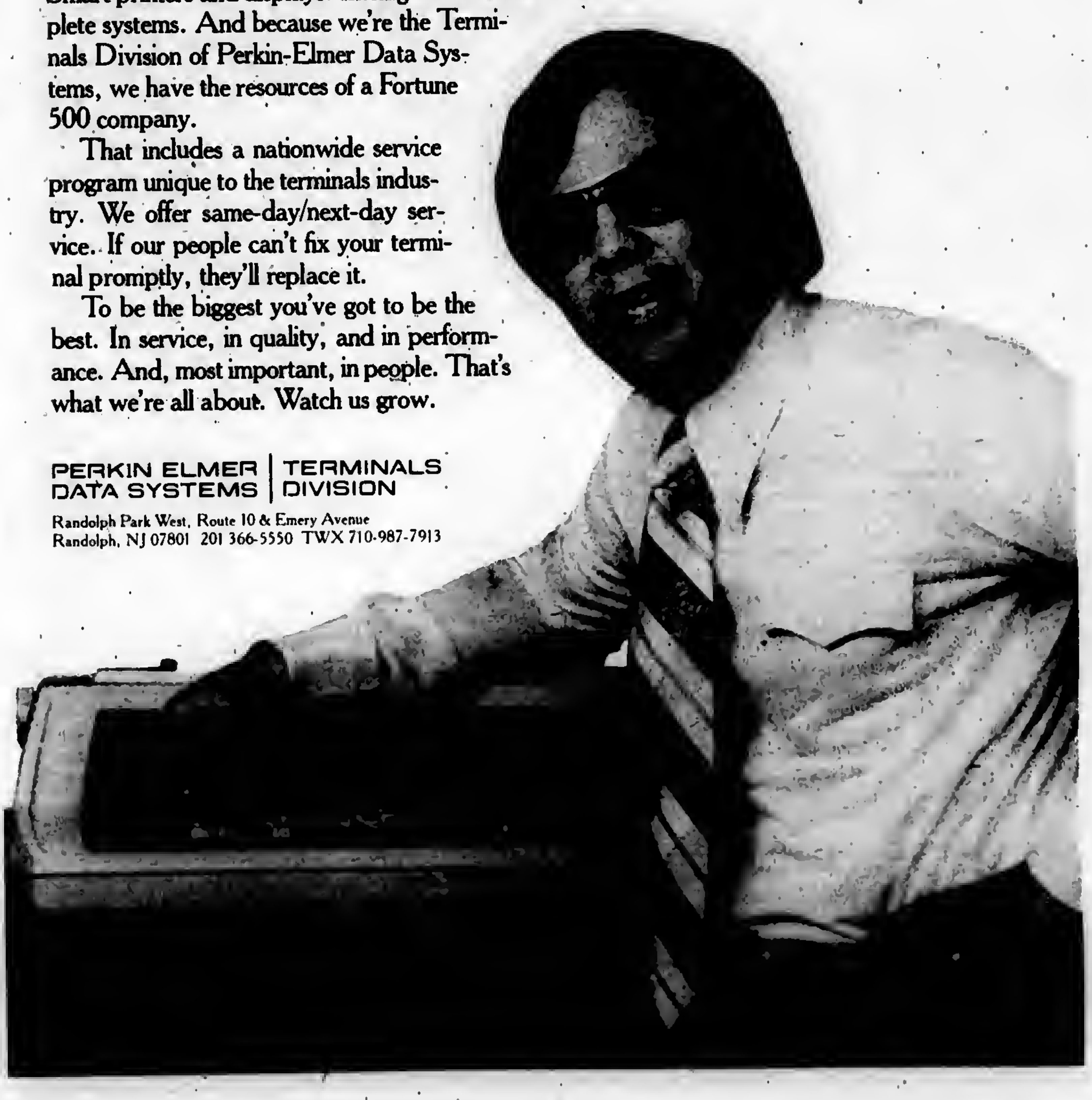
This information is then sent over the private line Teletype network at 10 char./sec to the cement plants and to the carriers involved in hauling the shipments.

This network provides a hard copy for the shippers and plants. It also includes very detailed instructions as to where the cement is to be delivered – often remote sites where streets or buildings do not exist, he noted.

After the trucks are loaded, the weight is noted on the Teletype copy and returned to the division terminal operator who retrieves the customer record from the system and adds the actual weights, according to Dell'Antonia.

Product prices, which were automatically included when the computer originally generated the order, are checked by the division terminal operator who can approve the entire order or withhold specific shipments if desired.

A terminal operator at General Portland's Trinity Division retrieves a list of formats from headquarters.



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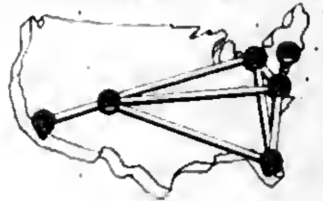
Through our Nationwide Network, you can supplement your existing computer by plugging into the **virtually limitless configuration**, infinite capacity and state-of-the-art technology of our 370/168's. Simply install a Remote Job Entry Terminal in your offices—or those of a remote subsidiary—and the power of the /168's (16 meg with VS, TSO, IMS, CRJE) is immediately available.

You'll save money compared with upgrading or replacing your existing machines—especially if it's well written down. **You pay** *only* **for what is used**; avoiding the quantum "step" costs associated with upgrades. Your loads can grow until upgrades are fully justifiable.

NATIONWIDE NETWORK



On our Nationwide Network (as with the central hardware and software) **economies of scale and utilization apply** offering substantial savings on the cost of communication equipment, associated central software and attendant network management.

eg: Network Management Supplements Capacity

PROBLEM: "We need to service a remote location, but we must carefully evaluate the costs and support required to enhance our existing facilities. What are our options?"

SOLUTION: This massive oil company with twin IBM 370/168 processors (with plenty of computing-power left) in a centralized environment is now servicing a remote location through MMDS' **Networked RJE Computing Power**. An imaginative approach from MMDS proved more cost effective than expanding their existing communications network.

By leasing one shift of an existing terminal facility, they received immediate benefits:

Testing	Shakedown of terminals, lines and modems not required.
Reliability	Redundancy (routing/lines) already built into MMDS' Network. Cost prohibitive if on their own.
Timeliness	Conversion, security procedures and systems set-up by MMDS' specialists—per requirements.

Had they expanded their existing network, they would have absorbed 100% of the following costs:

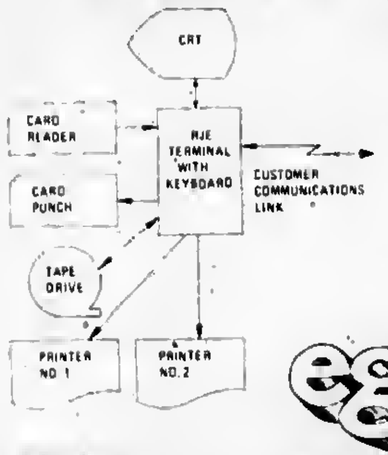
Terminal	$1,886/month
Dedicated Line	1,760/month
Modems	500/month

While spending only a third of the dollars they, more importantly, share in the economies of scale and utilization of the MMDS Network. Elimination of associated network management tasks was more than welcome.

2. RJE . . . as a **Replacement** for an existing facility

Using MMDS's Remote Job Entry Computing Power is **as convenient as running your own machine**. It's cheaper (10%–30% typically) and more versatile. Responsive to either growth or reduction in usage, you always work at 100% utilization: paying only for what is used.

EXAMPLE: RJE CONFIGURATION



On-site card readers, video terminals and printers are handled the same as those on an in-house computer. You test programs and run your systems exactly as on your own machine. **Operational control is unchanged**, except that mainframe tasks are handled by the MMDS "Host" Computing Center. Because of this difference you get: contemporary hardware/software, networked computing power, daily configuration flexibility and free access to MMDS' methodologies and tools.

eg: Manufacturer Replaces 370/135

PROBLEM: "Our remote locations need information distributed on a more timely basis. What additional hardware (local and remote), software and technical capability should we add? What are the costs?"

SOLUTION: Without increasing costs, this medium sized DOS user immediately satisfied his total requirements. He's now utilizing the latest in hardware and software without having incurred the in-house expense associated with implementing such enhancements. Tapping MMDS's **expertise in mini-computers and communications networking**, he installed a distributive data processing network. This distributive network allows placement of critical information at remote sites in a matter of minutes, not days.

MMDS's Networked RJE Computing Power is compared with this user's prior costs. Included are the costs of their distributive network—a Datapoint 2200 and two 1100s. With no major change in overall costs, he's expanded his service and added new systems: he's using our off-the-shelf Modular Application Systems (MAS).

	BEFORE MMDS	WITH MMDS	$ SAVINGS
Hardware*	$19,000/Mo.	$ 1,050/Mo.	$17,950/Mo.
Personnel	10,000	7,300	2,700
Supplies	2,500	2,200	300
Miscellaneous	550	120	430
Processing	-0-	14,000	(14,000)
Communications	-0-	600	(600)
New Hardware**	-0-	3,000	(3,000)
TOTAL	$32,050/Mo	$28,270/Mo	$ 3,780/Mo.

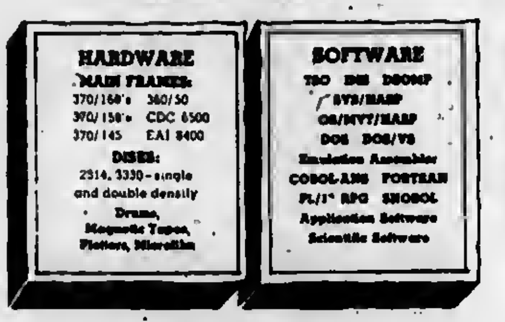
*In-house computer and related unit record equipment
**Terminals and minis

3. RJE . . . as an **Alternative** to acquiring a new computer

Instead of installing a small computer, consider **RJE Terminal Computing as an alternative**. You get your own card reader, printer and video displays; and you **use the terminal as you would your own machine.**

There the similarity ends. You avoid all the constraints of small computers: gaining speed, facilities, capacity, programming languages, off-the-shelf system libraries and flexibility. **You keep your options open**; while escaping the tyranny of machine amortization and the forcing of systems and installation schedules.

CAPABILITIES SNAPSHOT



Above all, from MMDS, you get business systems expertise and data processing discipline. With no cost for our *Systems Development Methodology* and free systems and programming tools, we pass on the *attitudes* and *disciplines* of successful computer/systems usage.

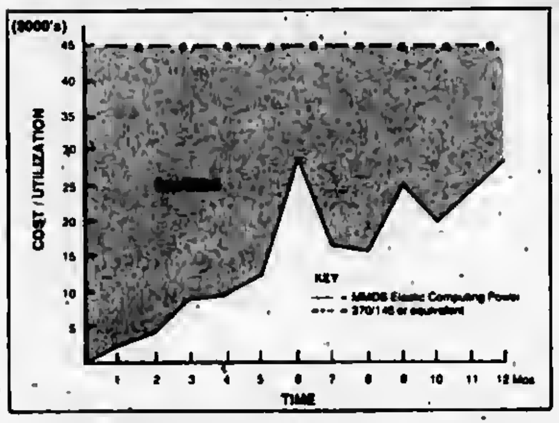
eg: State Agency Saves 50% in One Year

Problem: "Budget is not our problem! To implement our new system, we must accurately predict the eventual computer power and utilization requirements . . . as well, growth rate."

Solution: To implement their sophisticated "Road Design System," the agency considered acquisition of its own computer. A 370/145, or equivalent, was their best estimate. At $45K/month, all up cost, this would likely suffice for 2–3 years. At the same time, they recognized:

- In the short term, they'd have an under utilized machine (but continued upgrade would be a headache);
- a missed projection could be an expensive error.

MMDS is now supplying them "elastic" **computing power through an RJE Terminal**. In one year, RJE Computing Power helped them build experience with their system, determine their level of utilization and save over $300K, plus associated opportunity costs.



If the agency should elect to go to an in-house computer, its risks are now minimized.

. . . and the Technology to Support You

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MMDS Conversion Program

Operating as TSO commands, these programs produce a mixed conversion to OS and/or DOS simulation under OS—from DOS or other operating systems. The accompanying chart shows the conversion strategy used by these programs as a function of original program type:

ORIGINAL SYSTEM	METHOD OF CONVERSION	RESULTING OS SYSTEM	PCT. OF JOB AUTOMATICALLY CONVERTIBLE
COBOL DOS/D	MMDS Conversion Programs	DS ANS CDBOL	[illegible]
ANS/DOS COBOL	MMDS Conversion Programs	DS ANS COBOL	[illegible]
RPG I	MMDS Conversion Programs	DS RPG I	[illegible]
RPG II DOS SYSTEM 3	DOS Simulator	DOS RPG II Under Simulator	[illegible]
OBOMP	DOS Simulator	DOS OBDMP Under Simulator	[illegible]
BOMP	DOS Simulator	DOS BOMP Under Simulator	[illegible]
FORTRAN—Any	MMOS Conversion Programs	OS FORTRAN	[illegible]
DOS ASSEMBLER	MMOS Conversion Programs	DS ASSEMBLER Under Simulator	[illegible]
DOS JCL	MMDS Conversion Programs	DS JCL	[illegible]

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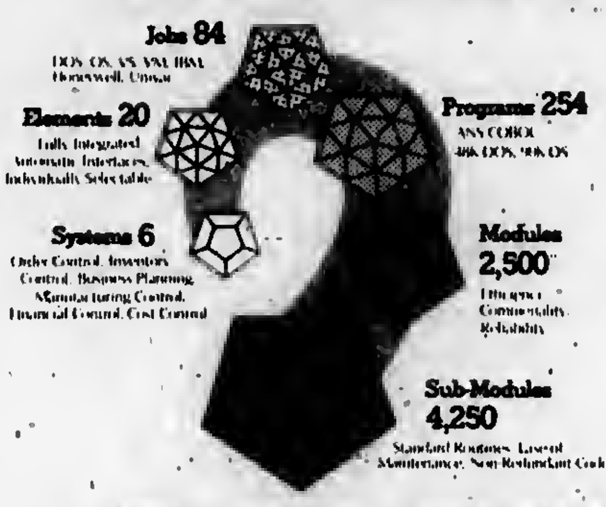
Jobs 84
DOS, OS, VS, VSI, IBM, Honeywell, Univac
Elements 20
Fully Integrated, Automatic Interfaces, Individually Selectable
Systems 6
Order Control, Inventory Control, Business Planning, Manufacturing Control, Financial Control, Cost Control
Programs 254
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Modules 2,500
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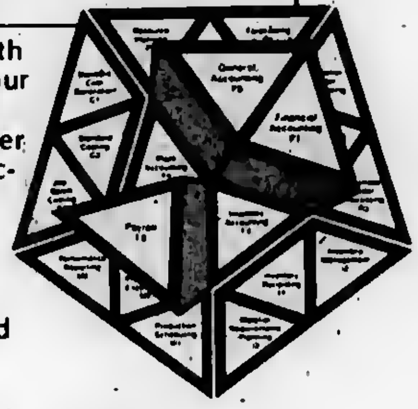

Problem: "We're projecting a 30% growth rate and need more timely processing of our financial data. We're also planning to add inventory and customer and purchase order processing systems. What's our most effective approach?"

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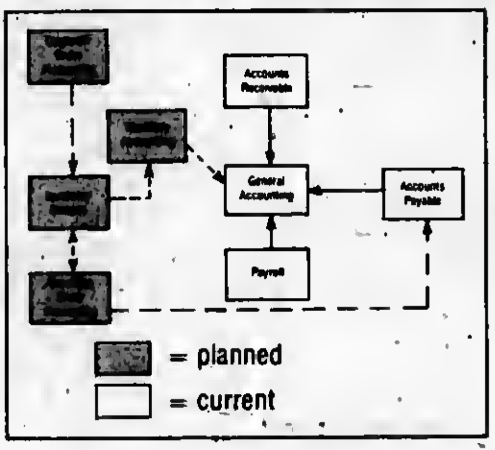

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Contractor Administers Benefit Fund

CPU Ensures Union Workers Get Everything Due Them

By Esther Surden
Of the CW Staff

PITTSBURGH, Pa. – Accurate recordkeeping is the name of the game at Weaver and Grose, Inc. here because this contract administrator is entrusted with keeping track of the work histories of more than 25,000 union workers in 15 unions.

The company is responsible for administering a union fund whose monies are distributed as benefits to workers employed by more than one concern in the course of a year, according to John Weaver, executive vice-president of the firm. The monies are collected from the various employers.

The mainframe at Weaver and Grose is an IBM 370/125 running under DOS/VS with 256K of memory, four Model 3340 disks, one 3410 tape drive, a 2501 card reader, a 1442 punch and a 1403-N1 printer. It was acquired as an upgrade to the firm's previous 360, Weaver noted.

About 50% of the work done on the system is dedicated to the contract administration function; the remaining half of the system's time is used by financial institutions and the local school districts. "We do our own financial accounting as well," Weaver added.

The firm has "evolved" the software applications over the 10 years of having IBM equipment, Weaver said. "We've written it all ourselves, modified and maintained it. We do use various programming packages such as CICS ... but the applications programs themselves have all been done by us."

Pleased With Vendor

The firm is very pleased with IBM service and reliability, Weaver reported. "It's the thing that makes us think twice when everybody else comes in and offers to give us comparable equipment cheaper. You don't really want to trade something known that is good for an unknown," he said.

Ten people work in the DP department where the primary application is organizing and storing the data on employer contributions and employee benefits needed to execute health, welfare and pension programs and to meet the strict accounting and reporting requirements of the federal pension reform act.

"The recent flood of pension plan terminations – there were more than 5,000 in 1975 – has raised two major concerns among plan participants today," Weaver said. "'How secure are our plans?' and 'What benefits will I or my family receive if I quit work, become disabled, retire or die?'

"The system provides us with the data we need to help assure union workers their rights to medical, life insurance, payroll savings, retirement, unemployment and other coverages are protected."

Central Record of Benefits

The system, which is used for more than 50 different union benefit plans, creates and maintains a central record of all benefits each worker has accrued over his lifetime. At the same time, Weaver said, it guards against loss of information – data on contributions, for example – and errors in accounting that could prevent a worker from receiving the benefits to which he is entitled.

Two programs form the core of Weaver & Grose's recordkeeping system. One organizes all information on employers and employees into master files; the other enables administrative clerks to call up these files on IBM 3270 CRT screens to answer inquiries, add new data and print reports.

The system provides a source for the data needed to comply with the Employee Retirement Income Security Act's reporting requirements. These include plan descriptions, filed with the Secretary of Labor; summaries of plan descriptions and plan changes, furnished to participants; and annual reports, supplied to the Internal Revenue Service and the Department of Labor and available to participants.

In addition, Weaver & Grose uses the data for quarterly work history reports, annual statements of workers' eligibility for benefits and summaries of their rights and benefits under each plan.

Standardizes Procedures

"The regulations have increased our paperwork," Weaver said, "and legal liabilities for noncompliance. But we can't let the scope of these regulations get beyond our ability to handle them. This means we must keep our operating procedures above standard."

In the past, he said, there was no practical way to coordinate all variables of information on any one employer or employee. Many workers have "travel" cards in several unions; steamfitters sometimes work as boilermakers, for example, and plumbers as welders when jobs are

(Continued on Page 32)

Holographic-Based System in Prototype

By Don Leavitt
Of the CW Staff

WOODLAND HILLS, Calif. – Developed by TRW, Inc. and now in prototype demonstrations, the Holofile data storage and retrieval system utilizes laser and holographic technology in a microform setting to cut both the cost and the space requirements of massive data bases, according to Holofile Industries, Ltd., which sponsored the development work.

One of the major advantages of the system, however, has nothing to do with space or cost, Holofile said. It revolves instead around an ability to retrieve a full image from only part of a holographic negative – making the system "highly resistant" to the hazards of physical damage, the company claimed.

Holographic recording, a Holofile spokesman explained, is "something like looking through a window. You have a view through the whole window, but you can effectively have the same view, even if half the window is blocked off, by changing your position slightly."

That is the basic difference between the holographic approach and more conventional techniques, he said. The usual DP media reading facilities do not permit this change of position to "see" what's in the undamaged part of a record.

The system apparently is not dependent on any specific mainframe since it will include an RS-232C standard interface. It consists of two basic subsystems, a recorder and a reader.

The reader is the portion now being shown and is expected to be in production next year, the spokesman added.

The recorder was designed to acquire and record electronic digital data in high-density holographic form on standard photographic film; the reader retrieves the holographic data and reconverts it to the original electronic form; according to the presentation that accompanies the current demonstrations.

While the prototype unit is based on the use of microfilm, Holofile expects the production reader to utilize microfiche. With a storage density of "up to 10M bit/sq in.," a 4-in. by 6-in. fiche can store as many as 200M bits of data, the spokesman said.

The recorder is expected to be approximately 19 cubic feet and the reader, a separate unit, about one cubic foot.

On a cost/bit basis, Holofile is expected to be directly comparable to more conventional storage media: An IBM 3330 disk pack, for example, has a cost/bit of 10^{-4}; a 10-in. reel of magnetic tape, 10^{-5}; and Holofile, 10^{-5} to 10^{-6}, according to the company's estimates.

Data reloading time is said to be 10 minutes on the IBM 3330, five minutes on the magnetic tape and .2 minute for Holofile.

Only in "access time" – not further defined in the demonstration documentation – does Holofile compare unfavorably with the disk media. The technology is said to take one second for this function while the 3330 handles the same thing in one-tenth the time. The tape access time was labeled only "long."

Holofile noted the two parts of the system can be used separately. Initially, since the recorder may not be ready when the production readers are, for example, the company expects to produce the

(Continued on Page 38)

Negotiations – Part 2

Prioritized List Aids Strategy

By Joe Auer
Special to Computerworld

Once a user's negotiation objectives have been well defined, the next step is to prioritize them into general categories and subcategories.

The purpose of this step is to keep the negotiation team on track and to establish the relative importance of negotiating points. This prioritized list is *not* for disclosure to the vendor.

Even seemingly minor prioritization can pay off. For example, having completed a rent vs. lease vs. purchase analysis of the acquisition method (even though this process should be done on a component-by-component basis), the "sensitivity" of each ingredient can be evaluated with respect to the total transaction.

You may find the residual value is not nearly as "sensitive" to the entire deal as the unamortized balance is at a given point in the payment stream where some flexibility is really needed.

This article, the second of three in a series about optimizing computer negotiations, deals with ways the negotiating team can preplan its strategy.

This flexibility may not be nearly as sensitive to the total transaction as the investment tax credit, which may not be as sensitive as any number of other things.

(Continued on Page 32)

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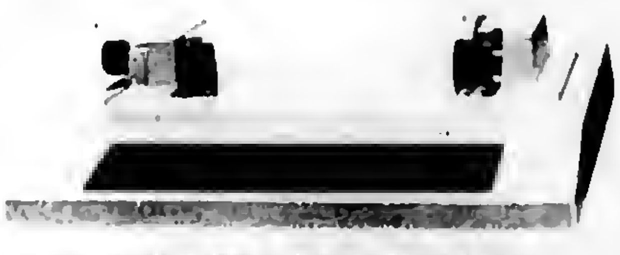

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Prioritized List Helps Negotiating Team Plan Strataegy

(Continued from Page 30)

By knowing these priorities and how they relate to the overall objectives, you can then effectively stand firm on points that are critical – and negotiate, or leave room for negotiations, on the minor points which aren't as sensitive to meeting your goals and objectives.

Concession Strategy

Generally, don't ever go into negotiations with only the items you hope to win; go in with more items so you can concede a few and still end up with an aggregate number of items that are necessary for ultimate success.

A lot of times, you can use the strategy of taking an item which is low on your prioritized list and blow its relative importance way out of proportion during negotiations; you can then end up eventually conceding that item if the vendor concedes several other items that have a higher priority to you.

The "several other items" are ones you planned to get, are critical to the acquisition process and are also, to you, more important than the one about which you had made such a big deal.

Establishing Parameters

After your objectives are prioritized, establish parameters for each priority. Your negotiating team needs to know how much latitude it has in each area.

At this point, an investigation of equipment and financing alternatives should be undertaken. A thorough study of the alternatives at hand is essential. Equipment and financing alternatives can be illustrated as a three-dimensional decision matrix.

The zero point on the axes is the situation in which a new computer system is rented from a single vendor. It is impossible to do anything but very lightly touch on equipment and financing alternatives now because they are major topics in themselves, but there are numerous points within the dimensions of this three-dimensional decision matrix that could very possibly satisfy your objectives within the prescribed parameters that have been structured, optimize the financial aspects of your acquisition and, at the same time, allow the various flexibilities you desire for the future.

The point is, however, to identify these points within the matrix with an understanding of their relationship to your ultimate goals and how you can be prepared to change negotiating strategies and/or establish "fallback positions."

Once this entire process of requirement determination is completed, obtain the concurrence of your negotiating team members; the team should then formalize a "negotiation position paper" for top management's approval.

The negotiating team must develop the strategies it is going to employ. Two key things to remember in developing strategies are (1) know your opponent and (2) know yourself.

If you have gone through all the steps recommended above, you should know your company's requirements fairly well.

When you investigate the vendor's track record, look not only at its record as a corporation, but also at the track record of the local office with which you will deal. This local office investigation is important in determining how it is doing year-to-date on its goal performance.

Also attempt to ascertain strategies that this vendor and the local office have used in previous, similar situations. On a corporate level, see what the vendor has done with other accounts throughout the nation.

You can determine this through interface with the various members of users' groups. You want to find out things like where the vendor's strategies have succeeded, when people have actually accepted policies it has tried to force on them and which negotiating strategies or marketing attempts have failed.

Then take a step back and evaluate the personnel that are involved, or that you anticipate will be involved, on the other side of the table, paying particular attention to the personal and professional capabilities of the vendor's negotiators and their strengths and weaknesses as just plain people.

Try to do an objective analysis of your own negotiating team's strengths and weaknesses so that during the rehearsal phase of planning you can develop strategies for things like good guy/bad guy, strong guy/weak guy and limited authority strategies.

You must decide whether you are going to overtly, as a team, have the authority to make a decision or whether you are going to use sidestepping and escape ploys to duck issues and say, "We need management approval on that particular item."

Auer is president of International Computer Negotiations, Inc., Winter Park, Fla.

CPU Ensures Workers Get Correct Benefits

(Continued from Page 30)

unavailable in their chosen crafts.

These workers qualify for benefits under a number of different union benefit plans. Further, in trades like construction, workers seldom have a permanent employer; some work for as many as eight contractors in one year.

"It took weeks, sometimes months, to research and update our records manually when new information was received on a worker or employer," Weaver said. "It was often easier to create a new file than to try to tie this data into existing files."

The present system "centralizes our records and makes possible administrative procedures that would have otherwise been too time-consuming, costly or impractical," he added.

Each month, Weaver & Grose receives statements from employers showing union workers on their payrolls during the last pay period, their hours worked and gross pay. Included with this statement is a check covering contributions from the employer toward the workers' benefit plans.

The company first checks Social Security numbers – key to accessing the master files – making sure they are correct on each monthly statement. It computes the contributions toward each worker's benefit funds, union membership dues and industry and apprentice funds based on the union contract with the employer.

These contributions are keyed into master files through the terminals, which update all records.

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Altered by Greater User Demands

Data Entry Technology Cited as No Longer Limited

By Toni Wiseman
Of the CW Staff

DENVER – New or advanced data entry technology has been somewhat limited while other aspects of DP improved in performance at phenomenal rates, but this is a thing of the past.

Today's approach to data entry has been permanently altered by advanced technology and greater user demands, Mary Lu Graham, manager of data entry for Supermarkets General Corp. (SGC), recently told attendees at the Super Market Institute's annual DP conference.

In SGC's case, the 1975 conversion from keypunched cards to key-to-disk equipment resulted in a 41.1% reduction in overtime, a 20.9% reduction in DP costs and a 29.9% increase in production, she said.

"Although the initial conversion represented a short period of increased expense, the results that have optimized the environment can be measured in increased levels of efficiency and reduced processing time," Graham told attendees.

The increased level of department performance encompassing improved accuracy, increased records per hour and reduction in DP time is the direct result of the application of equipment capabilities monitored by internally designed control features on the Data 100 Corp. equipment SGC chose, she said.

Increased Productivity

Fewer required keystrokes during the entry process, reduction or limitation of verification, direct automatic selection of format by the operator and the ability to immediately isolate and correct an error are system features that provide each operator with increased productive hours subsequently applied to the keying of more data, she averred.

Successfully operating at SGC, for instance, is an application that supports five concurrent balancing operations, a feature which allows either the automatic generation of totals, or comparison to a predetermined total, she said.

"Successful comparison, realized in 70% of our data batches, eliminates verification and reduces data entry processing time 457.3 hour/mo," Graham noted.

Errors Eliminated

Resident batches of Job Control Language (JCL) are an internal modification of each Job-In, Graham said.

As all possible data types relative to a particular system applications program reside under one corresponding Job-In, transmission errors pertaining to missing data, additional data or incorrectly applied data are eliminated completely, she added.

The search for an identified error, a complicated procedure on cards, now only requires the operator to key by mask a few characters that serve to identify the record. Recovery is automatic and immediate, she said. The error can be corrected or deleted and processing continues.

Although data entry is centralized in physical location, a decentralized environment is simulated because processed data is transmitted directly to the host computer via private line, she said, noting data is transmitted approximately 70 times per day.

After transmission, JCL batches and corresponding data batches remain resident on a temporary data set on the host computer until needed by the applications program.

"Our current operating environment, utilizing the control features supplied by system software and the control features designed to satisfy internal requirements, eliminated the area previously defined as the Input Control Department," she added.

While SGC personnel experienced reservations during the implementation process, they have now found the long-term, permanent benefits have far exceeded the short-term, negative effects, Graham said.

The reduction of overtime from 12.8% in the first quarter of 1975 in a 129 card environment to 7.5% in the first quarter of 1976 with the Data 100 equipment is a reduction of 41.4% as a percentage of salary paid, she asserted.

During 1975, SGC had 34 data entry positions. This was reduced by 5.9% in 1976 to 32, Graham noted. Five input control positions were also eliminated, she added.

The reduction in overtime and the reduction of personnel are major accomplishments and SGC realized a simultaneous increase in volume of processed records from 1.623 to 2.518 million, an increase of 55.2%, Graham stated.

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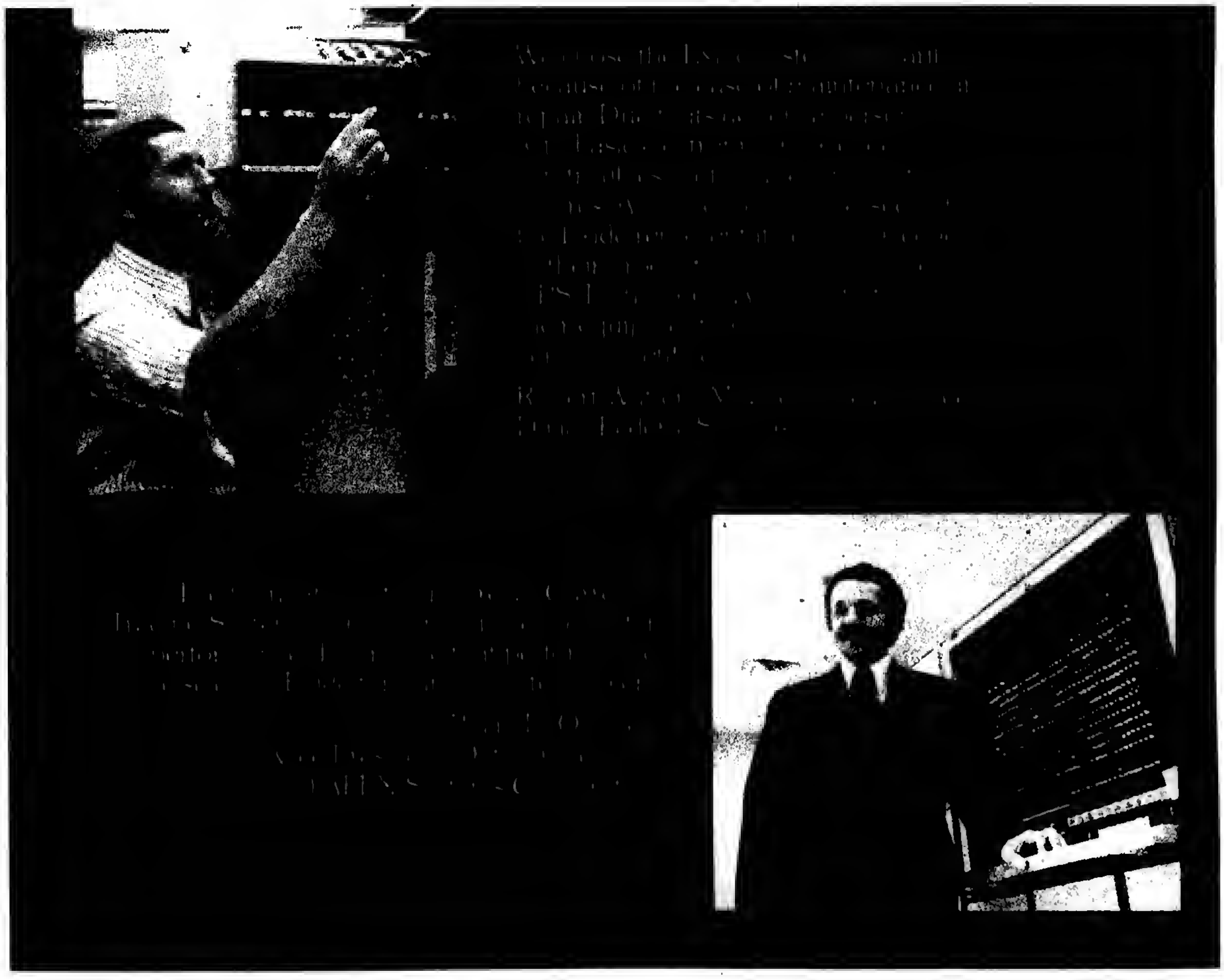

Key-to-Disk Units Alleviate Firm's Data Entry Bottleneck

By Esther Surden

Of the CW Staff

JERSEY CITY, N.J. – A data entry bottleneck at Shoppers Charge Accounts here has been alleviated with the installation of eight key-to-disk units, according to Don Conlon, vice-president of DP.

The firm services between 200 and 300 small retailers in the metropolitan New York area, evaluating and checking the credit status of the retailer's customers and advancing credit for the store. The company then bills the customer in the name of the retailer, Conlon said.

The firm handles over 100,000 statements each month, originating from sales slips handed in by the merchants involved, Conlon noted.

Prior to going with CMC-3 key-to-disk systems from the CMC Division of Pertec Computer Corp. the company had IBM 129 data recorders. And all the information had to be punched onto cards from the original documents and no controls over garbled numbers or lost slips were available, he added.

Now the company receives the documents from the store imprinted with the account number that appears on the charge slip and microfilms the documents. The data is entered directly onto disks, thus creating a permanent record, Conlon explained.

The data is batched to a 64K IBM 360/30 at Shoppers twice a day, Conlon added.

The units have eliminated the need for about 150,000 IBM cards per month and have freed about 30 hr/mo of CPU time, he noted.

Newfound Ability

Among the benefits cited by Conlon is the newfound ability to check for lost items.

"When the documents come in from the store we microfilm them and give them a sequence number. That means they cannot be lost. Then we keypunch in the reference number and every month print a missing reference number report.

"We could never check it out before," Conlon continued, "because we just punched the card into the computer."

Prototype Based On Holographics

(Continued from Page 30)

fiche for users.

The basic reader can be interfaced to peripheral devices such as CRTs, line printers and electronic note pads; the data stored on the fiche can be accessed by multiple concurrent users. Since it has a read-only capability, the unit has no need for the lockouts required to prevent concurrent updates, the spokesman said.

The separation of recording and retrieving capabilities impacts the applications for which the Holofile approach may be best suited, the company acknowledged, pointing to massive and generally very stable data bases as ideal.

The company estimated the reader itself may be in the $250 to $500 range. The recorder is expected to cost between $100,000 and $200,000, the Holofile spokesman added from Suite 243, 21243 Ventura Blvd., Woodland Hills, Calif. 91364.

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"This was an exceptionally well organized seminar. The material presented was significant and useful This seminar would be of great practical value to someone without computer contracting experience as well as serving as a useful outlet and review for those with more background and experience."
William C Prinn, Director, Advanced Planning
Chessie System, Baltimore, Md.

"I had no idea that we would have the opportunity to communicate so closely on an informal basis. That, combined with your excellent preparation, made this experience the most rewarding seminar experience I've had. I commend you for what I regard as a most worthwhile seminar, and thank you for your genuine interest in communicating with, and not merely to the participants"
SV, Attorney, Worcester, Mass.

"The appropriateness of this seminar is extremely important. This area of the Computer Science field has generally received little or no attention from user, vendor or the legal professions."
D.J. Connelly, Development & Control Manager
Norton Company, Worcester, Mass.

Roy N. Freed Is the Seminar Leader

Roy N. Freed is internationally known for his acuity and expertise in this field, and he will personally direct the entire seminar. A graduate of Yale Law School, Roy has served as inside counsel for a major manufacturer of digital computers, and is currently engaged in private corporate practice in greater Boston with the firm of Pollock, O'Connor and Jacobs. He teaches at Boston University Law School, and has written many articles on this subject, including "Computer Fraud, a Management Trap" (Business Horizons), and "Get The Computer System You Want" (Harvard Business Review). He is the author of the book, *Computers and Law — a Reference Work*, now in its fourth edition, and he also edited the complete, extensive course materials used in this seminar.

Charges and Enrollment

The charge for the entire 2½ day seminar, including continental breakfasts, luncheons, and all course materials is $325 per registrant. Additional registrants from the same company are charged only $275. This does not include hotel rooms, if necessary, but we have reserved space at the seminar hotels for attendees who wish them.

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Mini Bits

NCR 499 Printer Option Has 130 Char./Sec Speed

DAYTON, Ohio – NCR Corp. has enhanced its general-purpose NCR 499 minicomputer with the addition of an optional printer.

The printer, which can be installed in the field, increases the 499's printing speed from 75- to 130 char./sec.

The unit costs $1,500 from NCR in Dayton, Ohio 45479.

Cards for IBM 3 in Color

HORSHAM, Pa. – IBM 3 users can obtain a Rainbow Pack containing 20,000 cards in five different colors from Globe Ticket Co.

The pack consists of 4,000 cards each color – red, green, salmon, yellow and blue – printed in red ink and they can be ordered with either an upper right or upper left corner cut.

The pack costs $1.05 per 1,000 cards plus a $5 "put up" charge, the firm said. Quantity discounts are available from Globe at 680 Blair Mill Road, Horshan, Pa. 19044.

Monolithic Add-On for PDP-11

ENGLEWOOD, Colo. – Monolithic Systems Corp. has cut the price of its Digital Equipment Corp. PDP-11-compatible Monostore VII add-on memory system.

The price is now $795 for 4K by 16-bit memory, $1,075 for an 8K by 16-bit memory and $1,350 for a 12K by 16-bit system, the firm said.

Monolithic is located at 14 Inverness Drive East, Englewood, Colo. 80110.

Scientific Turnkey Announced

FAIRFAX, Va. – A turnkey minicomputer system designed for scientific and process control users is available from Nine Associates, Inc.

Based on the Honeywell Level 6/36, the system features a high-speed line printer outputting at 2,100 line/min.

The mini can be supplied with an analog-to-digital data acquisition front end, a high-speed on-line or off-line plotting system and a CRT or 60 char./sec keyboard send/receive teleprinter, the firm said.

Using a dual flexible disk system, the mini is oriented toward distributed processing applications, plotting or mapping and surveying types of uses.

A typical configuration includes the 6/36 with 16K of memory, dual diskette, CRT and a 2,400 line/min printer and costs $19,000 including software.

Nine Associates is at 10680 Main St., Fairfax, Va. 22030.

With Multitasking CPU

Basic/Four Extends Line at the High End

By Esther Surden
Of the CW Staff

IRVINE, Calif. – With the introduction of the System 700, Basic/Four Corp. has extended its line of small business systems at the high end.

The transaction-oriented system features interactive and multitasking operations and can support up to 16 CRTs, the firm said.

In the range of the low end of the IBM 3 or the Burroughs B700, the System 700's price starts at $115,000. The system features bisynchronous communications capabilities to allow it to communicate with IBM host mainframes, a spokesman noted.

The minimum configuration includes the CPU with 64K bytes of memory, four CRTs, a 300 line/min printer and two 50M-byte disk drives. It can handle up to 16 channels of full-duplex communications at 1,800 bit/sec over standard telephone lines, he added.

Current Basic/Four users must "trade in" CPUs to upgrade to the System 700; peripherals and software programs, however, are compatible, he said, adding some disk files may have to be "placed differently" when transferred to the system.

The CPU can address up to 128K of memory, Basic/Four said. The 600-nsec semiconductor memory is expandable in 8K increments with parity check, the firm added.

The CPU has an eight-page firmware set to allow it to contain an increased number of instructions; the CPU formerly used on Basic/Four systems had a five-page firmware set.

Up to 400M bytes of disk storage using removable disk packs can be accommodated by the system; the disk storage subsystem is microprocessor-controlled, the spokesman continued.

The System 700 features an enhanced operating system which takes up to 24K of memory. The Tri-State Language Processor for the 700, which Basic/Four said performs "preprocessing on the source code so the processor executes faster," is another feature.

"The operating system will permit numeric packing of any files before they are written to disk, resulting in a 40% reduction in the space required to store this data," the spokesman claimed.

The system uses Business Basic II programs and utilizes the Exception Analysis System for report generation/inquiry for exception reporting.

The unit also includes software spooling for more efficient line printer operations; up to two printers can be attached to the System 700, he noted.

The System 700 will be available in March; Basic/Four can be reached at P.O. Box C19550, Irvine, Calif. 92703.

System Helps School Conduct Summer Music Fest, Classes

By a CW Staff Writer

ASPEN, Colo. – Music Associates of Aspen has been using a minicomputer to handle a nine-week stretch of summer music festivities and classes during which payroll, student and artists files explode in volume.

Although using a mini mainly for peak operations is often said to be a wasteful proposition, the school had virtually no alternative, according to controller Michael Rohan.

"Our systems are so specialized we were better off programming in Basic and doing it ourselves; and we really needed an on-line system," he said. The nearest "real service bureau is about 200 miles away and telephone line costs would have been prohibitive," he noted.

The Data General Corp. (DG) Nova chosen by the school is a 3/12 with 32K of MOS memory, 10M bytes of disk, a CRT console and a 300 line/min daisy wheel-type printer.

The system hardware, including the educational discount the school received, cost $25,000. This could be easily justified because the school was paying $300/mo for an IBM magnetic card unit, which has been eliminated since the purchase, Rohan said.

Summer Events

During the summer, he explained, the institution sponsors the Aspen Music Festival and offers courses that are accepted for credit at the University of Colorado. Payroll increases from about 10 to 300 people. Artists are scheduled to appear and teachers are paid according to the number of lessons they give each student, he noted.

"About 200 artists appear in various time periods and we have to pay them on a fixed schedule. Their schedules are all set up on the CPU and the accounting department can look up all the necessary information on them as well as information on school vendors and school employees," Rohan said.

Another application of the system entails producing fund raising letters which are sent to prospective donors. The fund raising file is on the system and the letters can be configured in any way necessary, Rohan noted. The printer is of letter

(Continued on Page 42)

DG Announces Scientific Version Of Top-of-Line Eclipse C/330

SOUTHBORO, Mass. – Data General Corp. (DG) has announced the configuration of a top-of-the-line Eclipse minicomputer for scientific users.

The Eclipse S/230 includes hardware features already introduced with the Eclipse C/330 [CW, Sept. 6] which include:

- A 32K-byte memory module which doubles the density of previously available 16K core modules and features an 800 nsec read cycle time. The 64K-byte semiconductor modules have a 500 nsec cycle time.
- Main memory expandable to 512K bytes.
- Hardware mapping and protection that is said to allow concurrent programs to run in main memory with a look-ahead algorithm that increases processor speed.
- Expanded data channel address space which reportedly permits users to increase the number of peripherals that can be attached to the system. Data channel address space is now 256K bytes compared with 64K bytes for the previous data channel.

The system operates under DG's RTDOS or RTOS software and uses Fortran IV, Fortran 5, Extended Basic and Algol.

Application support software includes RJE80 for remote job entry, the Communications Access Manager and the Sensor Access Manager for sensor-based applications, the firm noted.

The S/230 with 64K bytes of core costs $19,000; with 512K bytes of semiconductor memory with error correction and the DCU/50 data control unit, the system is priced at $83,500; and with 256K bytes of cor, magnetic tape drive, 92M bytes of disk, CRT, Dasher 30 char./sec printer terminal and a 300 line/min printer, the S/230 costs $133,100, DG noted from Route 9, Southboro, Mass. 01772.

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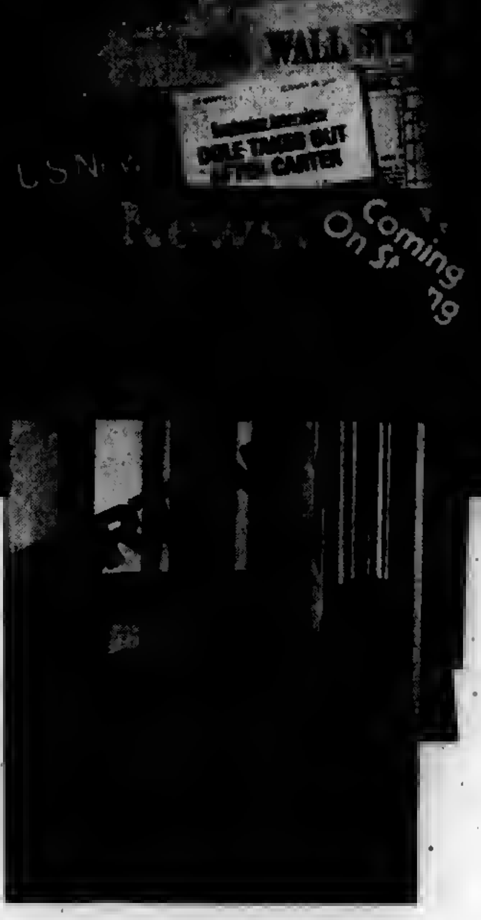

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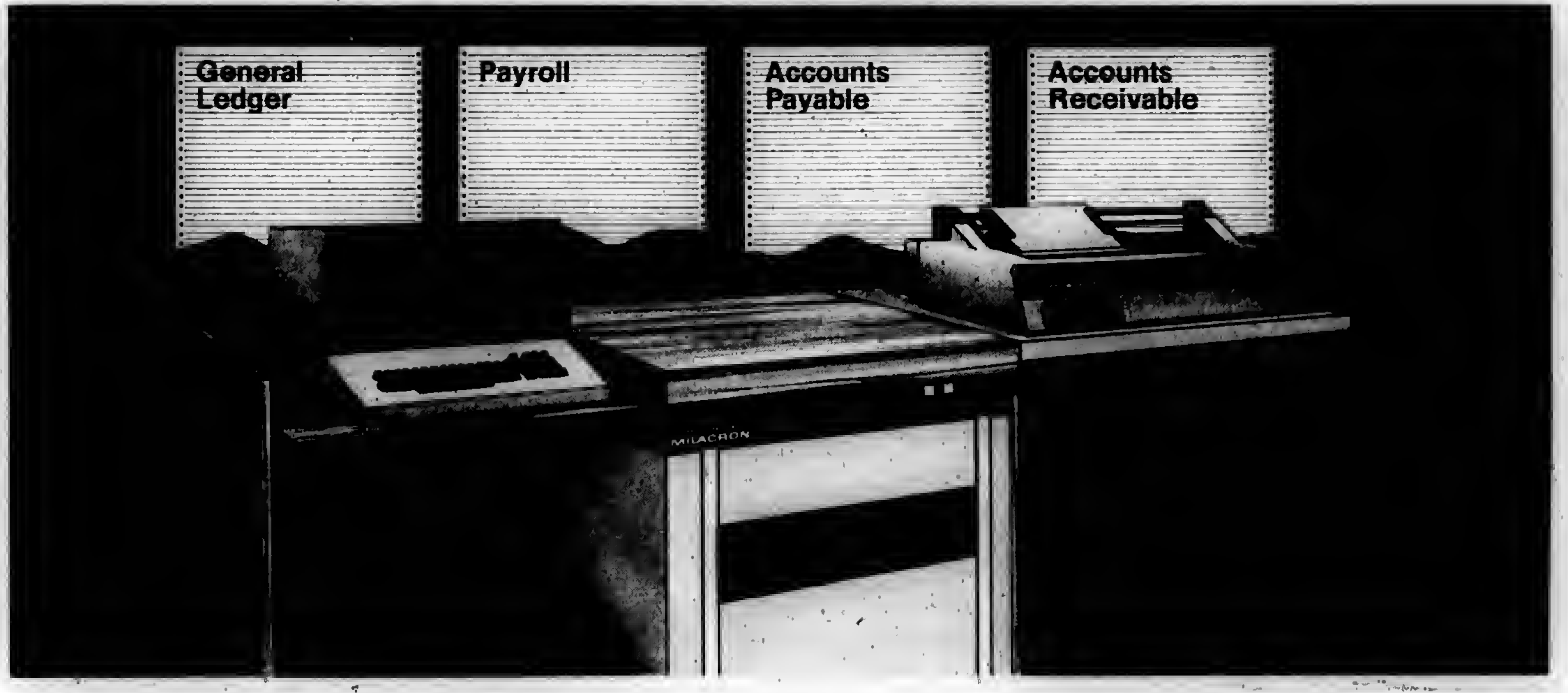

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CINCINNATI MILACRON

Micros Seen Giving Minis a Run for Users' Money

By Toni Wiseman
Of the CW Staff

LOS ANGELES – While minicomputer vs. microprocessor comparisons were relatively easy to make in the past, technological advances have changed the name of the game, Ed Zander of Data General Corp. told a recent conference here.

"Just a few years ago, microprocessors were commodity-type devices that could offer the OEM low-scale computing performance at low cost," but their processing power, memory and I/O capabilities were limited, he said.

In addition, their general incompatibility with other computers made them suitable only for well-defined "dead-end" applications that would not require significant system changes, he stated.

Today, however, a new generation of microprocessor-based board computers provide 8- and 16-bit architecture and more sophisticated memory and I/O schemes along with software and other support features which were previously limited to their "large ancestors," he said.

"They still can't match the processing power and functionality of modern minis, but due to their attractive prices they're carving out some new markets of demanding applications that cannot justify the higher prices of full-fledged minicomputers," Zander said.

Eight-bit microcomputers on a board are typically suited to data-handling applications that do not demand much computational or high-speed I/O capability or more than 4,000 or 8,000 word memories, he noted.

Sixteen-bit microcomputers, on the other hand, boast higher computational power and bit-efficient 16-bit instructions, he said. They are therefore suited to high-computational, real-time applications in instrumentation, process control, military communications and navigation, high-level communications and graphic arts.

"These machines can handle large main memories, usually up to 32K 16-bit words, and multiple peripherals and are supported by real-time operating systems and high level compilers; they're best suited to applications with minicomputer-like requirements," he stated.

Mini Still 'Heavyweight'

But, while 8- and 16-bit microcomputers have made great strides, the minicomputer is still the "heavyweight" in terms of processing speed, memory, peripheral variety and capacity, Zander said.

On the debit side, minis cost more than microcomputers on a board and their packaging flexibility is limited by their larger size, he noted.

"The microcomputer is a double-edged sword, offering higher potential for the right application along with the greater risk of faulty system design or implementation," Zander said.

The OEM must have a clear understanding of the specification differences between the two technologies and how they apply to his application before he can even begin to face the realities of designing systems based on micros or minis, he added.

Generally, minis are easier to implement because they come packaged with CPU, memories, I/O boards, peripherals and software – all pretested in system running conditions, he stated.

A microcomputer on a board typically must be configured into a working system by the OEM itself, a situation which can be devastating if the OEM introduces nonstandard parts into its "aspiring" microcomputer system, Zander said.

Compatibility is a key issue for the OEM, he said, since hardware and software compatibility assures the OEM its design investments won't go to waste when it adds to or changes its products.

"Now that higher performing microcomputers are creating new system-scale applications, compatibility has become critical to their long-term success in large systems as well," Zander said.

Hardware and software compatibility begin with the processor's instruction set, which should contain all the system instructions for running the CPU, memory and I/O functions the OEM will need, he said.

"System software for a microcomputer should be modular to make most efficient use of memory. This means the OEM should be able to program as much of the operating system as it needs and no more," he asserted.

Applications software can typically be brought on-line faster with minis than micros because of the minis' full peripheral support, sophisticated operating systems and dynamic debug facilities, he noted.

Implementation on micros usually involves emulators and cross-assemblers used in conjunction with time-sharing systems or minicomputer-based development systems, he added.

"Whether selecting minicomputers or board-level microcomputers, the final issue for the OEM is system compatibility with other standard products," Zander stated.

"If the vendor can supply necessary hardware, peripherals, additional memory, operating and development system software and a high-level compiler, the OEM will be able to put more of its design time into the end-product features, where its expertise better applies.

"And if the vendor can supply chip-level microcomputers as well as compatible minicomputers, all the better."

Mini Helps School With Summer Fest

(Continued from Page 39)

quality for this application, he said.

Accounts receivable and student accounts receivable are also on the mini. Terminals in both the institute's office in downtown Aspen and the home office are tied to the system through dedicated 1,200 bit/sec lines, according to Rohan. The CRTs are used for data entry in the accounting and billing applications, he added.

The applications software for the system was designed by Data Management Associates, a Colorado Springs software house. The school may negotiate with another local firm for software and consulting in the future, Rohan said.

"We are talking about expanding the system and putting on a winter user," but that move would be optional since "we have justified the cost based on the summer usage alone," he added.

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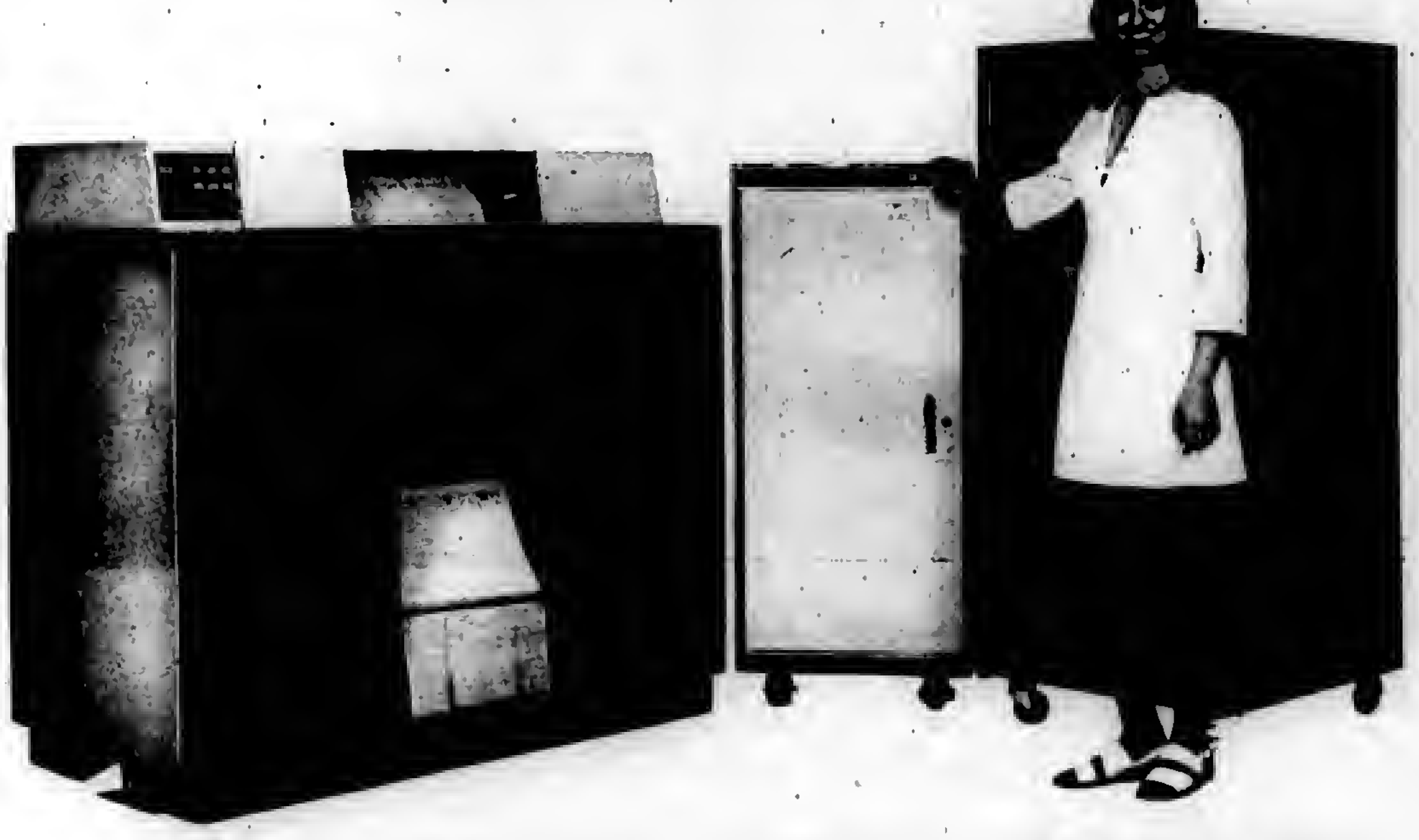

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Upkeep Weak Area

Mini Service Not Too Good

By Jon David

Special to Computerworld

Minicomputer Exchange

Minicomputer technology has advanced to the point where minicomputers are one of the most reliable pieces of equipment available. Unfortunately, a minicomputer system contains much more than just a minicomputer and users often find that if a printer goes down, a disk goes down or whatever, the entire system is effectively unusable. When you combine the reliability figures, the entire system has a much lower reliability than its components.

Most end users look beyond the capabilities of an operational computer system and try to determine what will happen when the system goes down. Manufacturers' representatives normally respond to this with impressive reliability figures, normally expressed in mean time between failure hours, days or processing units.

Regardless of the reliability of a computer system, it surely will go down from time to time. When it goes down it should be brought up as quickly as possible, and this is a question of maintainability rather than reliability.

Minicomputer maintenance is probably the weakest area of the entire minicomputer field. There are, of course, many reasons for this to be true.

At one time, people did not buy a computer, they bought a Univac. These days we find many companies no longer have computer rooms, but rather have IBM rooms. Companies such as Univac and IBM have tended to introduce significant hardware changes fairly slowly.

What this means is the man trained on the mainframe hardware of today will be servicing virtually the same hardware a few years from now.

Not so in the minicomputer field. Although about a dozen companies can justifiably claim to make large computers, nearly a hundred companies can claim to make minis.

There are significant differences, from an engineering point of view, between minicomputers; to develop or maintain a competitive advantage, minicomputer manufacturers regularly introduce new products with new engineering characteristics. We therefore have a situation where a maintenance person gets familiar with a piece of equipment just in time to see it discontinued.

Readers are urged to reply to this or any other Minicomputer Exchange article. This is your column, a chance for you to exchange views on the various topics confronting the minicomputer user, a chance to tell the vendors what you are thinking and to let your fellow mini users know about pitfalls or new techniques in this area. Letters or manuscripts should be addressed to Minicomputer Exchange, Computerworld, 797 Washington St., Newton, Mass. 02160. Double space please.

Where do all the minicomputer companies come from? They tend to come from other minicomputer companies. When they form, they try to take with them the best representatives of their former companies. Obviously, this includes maintenance people. Similarly, as companies grow, they expand their serv-

(Continued on Page 44)

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Mini Service Not Too Good; Maintenance Needs Improvement

(Continued from Page 43)

ice forces and normally do this by hiring the best they can from competitors.

Now, just as the best MG repairman might take a while to learn the characteristics of a Mercedes or a Cadillac, so do even the better computer service representatives take a while to learn new product lines. The minicomputer industry suffers from an environment with considerable maintenance force turnover and this hurts customer service.

Minicomputer manufacturers sell large quantities of equipment to OEMs. Some OEMs just buy the computer and use peripherals other than those obtained from the manufacturer. The manufacturer normally does not maintain such a system.

The OEM will usually service the system himself or arrange with a third party service company to service the system. In either case, since service is not done on a contract basis with the manufacturer, requests to the manufacturer for replacement parts normally get lowest priority, so even the most trivial repair may require a system to be down for an extended period.

Manufacturers' service organizations have their problems, too, and these problems are often not palatable to an end user.

All manufacturers train their personnel, but there is a tremendous difference between a merely trained service representative and one experienced with the particular systems and equipment being serviced. Experienced personnel tend to be in the minority because of both great personnel turnover and the introduction of new equipment.

Another problem is parts. Even if a manufacturer has a service department in your area, he may not have a parts depot; if he has a parts depot near you, there is no guarantee that he will have the part you need.

Reviewing the minicomputer service station, we find it is not too good. Although proven systems and equipment do not go down overly frequently, they do go down. The maintenance representative who shows up to service your equipment is often far less than expert with it. If you need a part, you frequently have to wait at least a day or two to get it.

Can you afford this? You have to. If a particular vendor guarantees he has a super special maintenance service package for end users, the world's most qualified service staff and largest parts depot or whatever, you can believe him. You can also believe the moon is made of green cheese. Expect to have service problems and plan for them.

The only way to minimize the likelihood you will be hurt by minicomputer service is to design your application and operational flow to guard against your system being down for a period of at least two days.

This may mean you must generate extensive printed reports for no other reason than their use, should the system go down; that you must store your data in an industry-compatible format on an industry-compatible device (such as a magnetic tape) so you may have key functions performed at another installation; that you must program in a "portable" higher level language so you may take your programs to another installation, and the like.

If your situation is sufficiently critical, you may have to buy a complete second system to act as backup for the first, should it go down.

Plan for it to be down, and you will be ready when it is down; assume it won't go down and you may find yourself in very, very serious trouble.

David is president of Minicomputer Industry National Interchange (Mini), a professional society treating minicomputers, microcomputers and associated technological techniques, and is also president of Systems RDI.

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COMPUTER INDUSTRY

CI Notes

HP's Micro Its Own?

PALO ALTO, Calif. – Could it be that the heart of the new but as yet unnamed "microprocessor-based" CPU of the Hewlett-Packard Co. (HP) 1000 system is the product of its semiconductor laboratories?

An HP spokesman answered the question with a "no comment."

Referred to internally as the XE processor, the unit is expected to be featured in a separate product announcement later this fall, industry sources said.

NCR Keeping Paper Division

DAYTON, Ohio – NCR Corp. has decided against selling its Appleton Papers Division and discontinued discussion with interested parties.

"We have determined that the corporation's interests will best be served by retaining this paper business, which complements the company's production of computer and other electronic business equipment," NCR chairman William Anderson said.

The decision was the result of a comprehensive review of the division's markets, operations and prospects, he added.

Univac to Expand Personnel

BRISTOL, Tenn. – Univac plans to add 400 employees to its payroll here, including more than 100 technical, professional and management personnel.

Initial projections indicate the increase in employees will increase the output of equipment at this facility by $30 million annually, Univac said.

The plant's primary product is the Univac 90/30 system.

CDC Forms Special Group

MINNEAPOLIS – Control Data Corp. plans to form a special systems engineering department in its Washington, D.C, facility to design, develop and test document-handling products.

The department will initially be staffed by a group from CDC's Rockville, Md., plant, which is scheduled to be shut down.

The Rockville product line of optical character recognition (OCR) equipment is being transferred to a Roseville, Minn., plant., according to the firm.

Views on Leasing – Part 2

Lessors 360 Buys a 'Millstone': IBM

By Molly Upton

Of the CW Staff

NEW YORK – IBM's Market Evaluation Department felt lessors' naivete about the impacl of the New Series (NS) line and their massive purchases of 360s in 1968 spelled trouble for the industry in the future, according to a 1969 report recently filed as evidence by the Justice Department in the U.S. vs. IBM antitrust trial.

When the department looked at the leasing industry in 1969, it reiterated its previous assessment that lessors would be adversely impacted by the forthcoming NS, or 370, line [CW, Sept. 27].

It found diversification efforts by lessors had not had a large impact. Of nine major companies, only two obtained less than 50% of their revenues from 360 leases and only three were less than 70% dependent on computer leasing, the report told management.

In fact, the leasing industry's 360 purchases in 1968 exceeded even IBM's projections. While IBM had expected lessors to purchase about $600 million in gear, 360 purchases topped $1 billion and the leasing industry's total 360 investment reached $1.5 billion the report said.

360	To NS	Price Performance Improvement Of NS Over 360*	Required 360 Price Reduction**
Model 30	NSO	2.0	50%
	NS1	1.7	40%
Model 40	NS1	1.6 to 1.7	40%
Model 50	NS2	1.5 to 2.0	35% to 50%
	NS2M	1.7 to 2.4	40% to 60%
Model 65	553	1.3 to 2.3	25% to 55%

*Source: IBM Systems Development Division presentation, March 1969.

**To match NS price/performance. Current discount level is approximately 15%.

IBM, in its 1969 market report, outlined the price reductions it thought lessors would have to offer in order to make 360s' price/performance competitive with the forthcoming NS, or 370, series.

"The level of [lessors'] purchases in 1968 might turn out to be the proverbial 'millstone,' " the report observed.

"In our view, the pace has been too fast. The overall leasing company picture is far from good because a very large percentage of the industry's rather young inventory is subject to strong competitive pressures – to impact!" the department said.

For example, 40% of lessors' total investment was in CPUs, "all subject to quick/easy displacement if the 'next generation' is compatible – as we understand IBM's NS will be," the group pointed out.

More than $300 million worth of the lessors' investment was in 2400 tapes and 2311 disks, "both highly vulnerable to impact from 2420- and 2314-type devices," the report said.

By 1969, lessors owned 30% to 40% of all 360s being rented by customers, and IBM didn't see much chance that world markets would open up for used machines.

The analysis saw after-tax earnings of the leasing industry turning abruptly downward in 1971 and falling into a loss posilion in 1973.

It predicted the pattern would be $106 million in 1970, $69 million in 1971 and $52 million in 1972.

Given the general discount level by lessors of 15% in 1969, IBM said it conservatively estimated this would be 20% in 1971, 25% in 1972 and 40% in 1973.

The average date of purchase of the leasing industry's 360s was August 1968. Using this date, IBM observed that in mid-1973, nine years after announcement of the 360, when it "in all likelihood will be out of production, the industry's inventory will be only five years old – half the life upon which leasing company

(Continued on Page 50)

Promise Plus Problems Expected For U.S. Suppliers in Europe

By Don Leavitt

Of the CW Staff

LONDON – There is a substantial and growing market for DP products and services in Europe, but U.S. and Canadian suppliers interested in this market area must be aware of potential problems as well, according to *The Continent of Opportunity – Europe 76/77,* published here recently.

Prepared by Expertise International, a local consulting group, the booklet noted the 16 countries of Western Europe have a population 50% larger than the U.S. with a gross domestic product 6% to 7% larger.

In computer terms, Europe is less advanced than North America, but is growing at a faster rate, the report said. Computer services – including software products – are growing even more rapidly than the hardware sectors, the consultants continued, adding "currently 33% of the total market services are expected to account for more than 40% of a much larger market in 1980."

But U.S. and Canadian firms "would be wrong to view Europe simply as a convenient extension of the North American home market," the authors warned. There are "substantial differences" between Europe and North America "and, for that matter, between different countries within Europe," they said.

Market Needs Vary

"Furthermore, market needs and acceptances vary – a product that sells well in Dallas may be totally inappropriate to the requirements of users in Dijon, Dusseldorf or Durham," they went on before turning optimistic with the thought that "a product with a very unexciting home sales record may turn out to be a real moneyspinner east of the Atlantic."

Exchange rates fluctuate and confuse the picture, yet "very broadly speaking, hardware prices in Europe tend to be related to U.S. list prices, but charges for services depend predominantly upon local labor costs," the booklet noted.

Further, "the attainable financial ratios

(Continued on Page 47)

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In Preliminary Report

ADTS Outlines Savings Plan for U.S. Use of DP Gear

By Molly Upton
Of the CW Staff

WASHINGTON, D.C. – The Automated Data and Telecommunications Service's (ADTS) plans to promote savings in the government's use of DP gear include increased use of plug-to-plug contracts, third-party contracts, reduced rental costs through leaseback contracts and exchange/scale restrictions.

In a preliminary report to the Office of Management and Budget regarding the Presidential Management Improvement Initiatives [CW, Sept. 13], the ADTS unit of the General Services Administration (GSA) said it intends to contact agencies to have them review their own situations on these aspects.

It will also require agencies to publicize in advance their procurement plans in the *Commerce Business Daily.*

The ADTS said estimates indicate the government lost $6 million in fiscal 1976 because present regulations allow an agency to exchange or sell automatic data processing (ADP) equipment to commercial firms even though there is identical equipment being leased by another agency.

The ADTS is preparing a temporary regulation to restrict an agency's use of exchange/sale transactions in order to preclude the potential losses.

In its drive to increase the use of existing GSA requirements contracts for plug-to-plug-compatible gear as replacements, where possible, for equipment rented under ADP schedules, the ADTS plans to request agencies to review their rental plans.

Also, it is reviewing the management information system printout, which it said lists about 560 pieces of equipment representing over $723,000 in monthly rentals.

From this it will determine a priority schedule based on release date and quantities to contact agencies to investigate possible replacements.

The ADTS indicated new requirements contracts for eligible equipment will be established if warranted.

"Also, we shall intensify our review of all agency procurements to ensure that there are no undue restrictions on the acquisition of plug-to-plug-compatible equipment," the report said.

Regarding increasing the use of third-party ADP contracts, the ADTS will request agencies to review equipment under ADP schedules with the objective of replacement with more economical equipment from third-party vendors, the report explained.

It plans to intensify its review of all agency procurement to ensure there are no "undue restrictions" inhibiting third-party participation.

Europe: Promise and Problem

(Continued from Page 46)

such as return on capital employed, gross profit margin on sales or price/earnings, will vary from country to country" and "it is unrealistic to attempt to impose global corporate standards," it continued.

A European operation can neither be inaugurated nor effectively managed by remote local at a distance of 3,000 miles or more, the consultants added before suggesting "local expert advice and assistance are essential if mistakes and disappointments are to be avoided."

Smaller Market Sector

Getting down to details, the booklet noted the government market sector in Europe is a much smaller proportion of the total market than is the "public sector/defense/space sector" in the U.S. Governments in some cases afford some measure of preference to their own national concerns, the report said.

"Not surprisingly . . . Europe has not developed any indigenous manufacturers or service companies of a size comparable to IBM, Digital Equipment Corp. or Computer Sciences Corp.," the report continued. Almost all the big suppliers are already owned by U.S. or European major corporations or governments, it noted.

At the middle and lower end of the company-size spectrum, however, "there are some very interesting independents." Because of financing problems, for example, there are, "from time to time, some excellent opportunities for a North American company to buy into an established European operation on attractive terms," the report said.

Potential Problem Areas

Potential problems fall into two categories, the report said. The first involves problems with which the management has had previous experience and which are usually common regardless of location.

The second group contains problems which are new to a firm and which generally arise from local conditions.

The first category covers technical and engineering bugs, project control, quality control, bid evaluation and preparation and staff training. "It may be assumed that a concern which does not have adequate standards, methods and procedures to solve problems in these areas is unlikely to be seeking to expand its operations into Europe or anywhere else," the consultants added.

The second set of problems includes both precise factors, such as the state of the local economy or the provisions of local legislation, and the less-tangible influences of local customs, usages and prejudice, they continued.

"For the wary, forewarned is forearmed and prior knowledge reduces most of the difficulties to minor irritations," the booklet continued.

Copies of *The Continent of Opportunity – Europe 76/77*, are available free from Expertise International, Cleveland Road, Uxbridge UB8 2DD, Middlesex, England.

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Intel Sees Marketing Prime Problem in Add-On Area

By Toni Wiseman
Of the CW Staff

SUNNYVALE, Calif. – Marketing, not technology, is the dilemma facing add-on memory manufacturers in today's marketplace, according to Gordon Reid, product manager for Intel Memory Systems.

"Technology has rushed ahead such that innovations like charge-coupled devices (CCD) and 16K-bit devices like the 2116 are available to users, but marketing has not yet uncovered the market to use the technology in volume," Reid said.

And, he asserted, there will not be a major market for these advanced devices until there is a shift in attitude on the part of users – until they recognize the benefits they can realize despite a higher price.

Since Intel is primarily in the semiconductor and micro business, it's only natural for the company to focus on new markets where these can be used, like the non-IBM add-on market, Reid said.

"Our primary focus was originally on large IBM systems, but that meant we were only addressing 60% of the total market," he added.

Now, however, the company is focusing on providing memory to end users of non-IBM systems, such as Digital Equipment Corp., Interdata and Modular Computer Systems, Inc. and concentrating on reducing the cost to the user and increasing the performance in terms of cycle and access time and reliability, he said.

"We're able to do this because we make our own chips," Reid said.

Intel is currently addressing the DEC PDP-11/70 market in which Reid estimated there will be 2,500 users in a relatively short time – three to five years.

"The 11/70 is oriented to the time-sharing, multiple user who is going to require very large amounts of memory, which makes our product attractive on a price/performance basis," he said.

DEC provides 2M bytes of memory for the PDP-11/70, he noted, with the size limitation based on cable length. Intel has packaged four times as much density and can therefore provide the user with 4M bytes, he said.

CCDs are a reality – Intel has them, Reid said. The system provides 2M bytes in a single chassis with a controller.

CCDs, he added, are ideally suited to applications looking for very fast response time, such as time-sharing where a user needs to reduce latency and has high reliability requirements.

"I feel fixed-head disk CCD is going to be a part of memory in the future, but it has not found its place yet," Reid stated. "The industry is still struggling to identify where it fits. As a result, we haven't identified a broad enough market.

"And this means that the technology is expensive now," he stated while asserting the price, as with other memory devices, will go down as the number of products sold goes up.

CCDs' impact should begin to be felt among large users within the next two years, he predicted.

The shift will come when managers change their view of how they operate their shops, he said, and realize the cost benefits of error correction and error logging within the system.

This will mean errors are detected only during preventive maintenance time and not impact the operation of the system during use.

"We're building them today so we can offer the system right now, but the marketplace has not shifted its attitude to understanding what it costs to have an engineer go out and do error correction," he emphasized.

And, he said, it will probably take some time for the marketing people to relay these benefits to the users.

IBM Watchers Expect 380 by End of Year

LONDON – The unobtrusive arrival of the IBM 370/138 and 148 and their low purchase price indicates to many IBM watchers an end-of-series sales attitude and increases the strength of rumors that the 380 is due for a year-end announcement, according to *EDP/Europa Report* (EDP/ER).

"What is certain is that the introductions strengthen IBM's range in the middle range where [it has] been increasingly under pressure by everyone, from the super-mini makers to the major mainframe makers," EDP/ER stated.

"It is notable, now, that IBM's current architecture, still largely based on and a direct descendant from the 360, appears increasingly rigid when compared to the current offerings of ICL, Burroughs, NCR and others," the newsletter noted.

Industry observers are particularly interested by the new systems' low purchase price, only 35 times the monthly rental and less than the 370/135 or 145 prices, EDP/ER said.

Contracts

HP Signs Dataproducts

WOODLAND HILLS, Calif. – Dataproducts Corp. has received a contract from Hewlett-Packard Corp. (HP) for the supply of printers ranging from 300- to 1,800 line/min.

The contract, which is the largest between the two firms, could represent $15 million in shipments, including spares, over three years, Dataproducts said.

The printers will be used with the HP 3000 Series II as well as the 9600 minicomputer, Dataproducts said.

Other Awards

Pfizer Medical Systems, Inc. will use Ramtek Corp.'s RM-9100 Medical Imaging Display Systems in its Acta-Scanner whole-body computerized tomographic scanner.

Optimum Systems, Inc. has received a one-year contract to provide the U.S. Department of Labor's Employment Standards Administration with computer services necessary to administer the Federal Employees Compensation System.

Codex Corp. has completed delivery of an initial $215,000 contract for its LSI 9600 and 4800 modems to Televerket Norway.

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Industry leaders unite to organize DataComm 77
Leading data communications industry organizations have joined forces to make DATACOMM 77 the national focal point for the datacomm community. Conference organizers are the Association of Data Communications Users, Auerbach Publishers, Computerworld, DataComm User, and *Datamation*.

East African Airways Takes Off With In-House Booking System

By Ivan Berenyi

Special to Computerworld

NAIROBI, Kenya – The first airline reservation system in this part of Africa has gone live with Nairobi-based East African Airways (EAA).

It is also one of the first to use IBM's CPSIM(E) package – a scaled-down version of Ipars running under DOS/VS instead of APC.

The African International Reservations System (Airs) was implemented by Eastern Airlines, which for the last three years has held a consultancy contract with EAA. Airs is based on a 256K-byte IBM 370/135, installed before the reservations development plan got under way to replace two 360/30s which had handled south/north reservations in batch mode since 1967.

"With less than 700,000 passengers a year, the decision to go to an in-house rather than a shared system was a difficult one," according to outgoing computer manager Don E. Prince, who readily admitted IBM offered ample extra time for the pains of pioneering CPSIM(E).

"If it was at all possible, the board of directors preferred to go to an in-house on-line system in order not to continually rely on outside help to support the airline," Prince said.

Despite a reduction in the proposed number of staff, a government monopoly on modems and malfunctioning teletypewriter lines, Airs was up and running just 12 months from the project start – six months ahead of IBM's recommended launching date.

International News

EAA's outgoing DP manager, Don Prince of Eastern Airlines, switches on Airs with on-line systems manager Avtar Sehmbi and lead programmer Joe Mambo.

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Lessors' 360 Buys Termed 'Millstone'

(Continued from Page 46)

profit depends."

The planned compatibility of the NS with the 360s would be a liability to the lessors' extensive inventory of 360s, the IBM report predicted.

Industry leaders, the report observed, seemed to feel that "a) IBM will not *functionally* obsolete System/360, b) installed life will be more than twice rental/purchase multipliers and c) lease revenue for 10 years can be achieved with discounts that do not preempt profitability.

But, IBM pointed out, resulting compatibility would be detrimental to lessors because the new systems would receive faster market acceptance. The report predicted 4,500 NS CPUs would be sold and shipped by the end of 1972.

"Based on our estimates of leasing company 360 inventories in the early 1970s . . . [lessors] must extend life at least three years beyond the point that a similar leased IBM inventory will have been completely displaced by NS (current IBM Group objectives indicate 1974 as the latest date). No matter how one looks at it, 1977 is a very long time away," the evaluators remarked.

'Too Right' Prices

The 1968 report agreed with those who felt the NS strategy was essentially the leasing company's game – primarily one of price/performance. However, the 1969 report observed, the leasing company price must be "right," and it cited the overhead expenses to lessors such as placing machines, carrying those off rent, etc.

"Although it is difficult to look as far ahead as the late 1970s, it is nevertheless also difficult to foresee how early 1970 discounts of 40% to 50% can hold through the greater part of the decade.

"Thus it is conceivable that the price will heve to be 'too right.' A 10-year life that produces no profit is hardly a way to run a business," the report commented, conceding the useful life of a 360 could be 10 years.

"Under this pressure of discounting, a threat will exist not only among tha leasing companies, but may spill over and affect the pricing policies of the manufacturers themselves."

IBM explained its NS would be in response to introductions of fourth-generation equipment it anticipated would be made by its competitors in the early 1970s. The report indicated the competitors had technical capabilities (i.e., memory and components) comparable to IBM.

IBM's NS, in response to these moves, would be in the 360/20, 30, 40 and 50 range where leasing companies were heavily invested, the report said.

The 1969 report held out little hope for lessors' successfully implementing the alternative to discounting, which was improving 360 performance.

"We concluded once more . . . that there is no magic answer, system or approach which would allow an across-the-board upgrading of the industry's installed inventory," the report said.

After examining various methods, both hardware and software, most of which it categorized as customizing efforts, the report said, "While individual companies might gain a measure of success in this way, the price/performance of the total industry inventory will not be materially affected."

IBM Trial Documents

While the report declined to estimate levels of purchases of the next generation of equipment, it observed it didn't expect a very high level of buying of non-IBM fourth-generation equipment. The reasons, it said, were:

- Major computer manufacturers were continuing to expand their offerings of long-term lease discounts.
- Competitive lease-purchase multipliers would tend to move toward the IBM level as companies get safely around the profit corner.
- The then-present price disparity between plug-compatible vendors' and computer manufacturers' peripherals would narrow considerably as the DP market continued to develop.
- "With their ultimate success tied to second users, leasing companies [would] be wary of investing heavily in products [with] a limited potential, i.e., when total installed equipment represents no more than 10- to 15 million points" [about $750 million].

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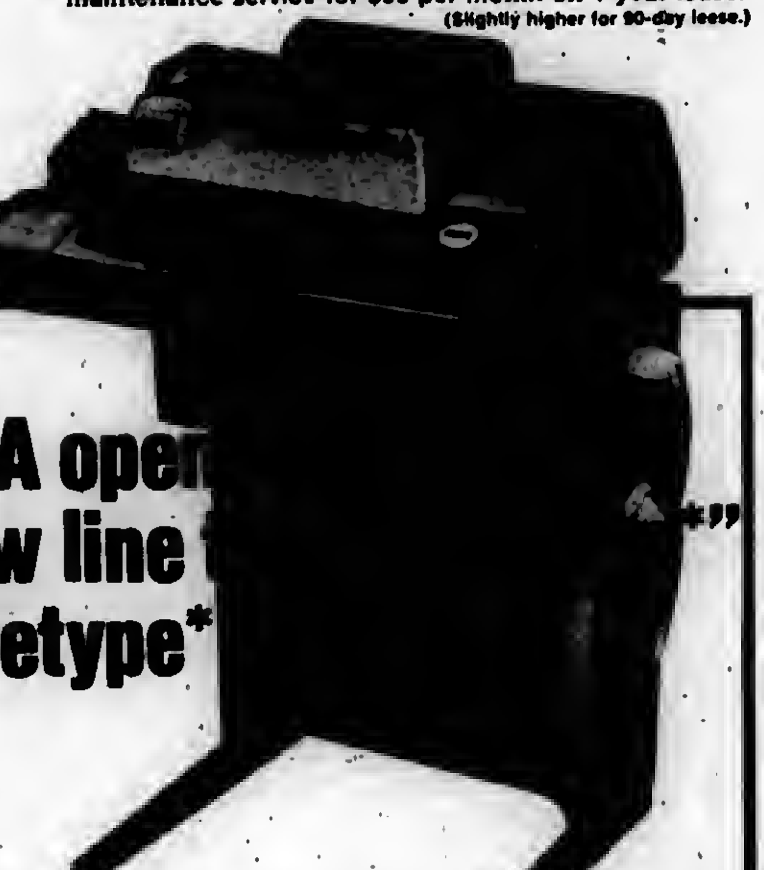

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Now Offering Controllers

Innovex Expects Sales to Rise 100% This Year

By Molly Upton
Of the CW Staff

BEDFORD, Mass. – Innovex Corp.'s 1976 sales should be twice those of last year, according to Michael Keating, vice-president of sales and marketing.

The firm has increased its distribution force and is also offering controllers along with its floppy drives, which is increasing its sales to small systems houses, Keating said.

The firm is offering microprocessor-based controllers for a variety of minicomputers, including those of Digital Equipment Corp., Data General Corp., Interdata, Inc., Keronix, Inc. and Computer Automation, Inc., he said.

Most of Innovex's sales are still on an OEM basis of drives only, he added.

The advent of the microprocessor has enabled Innovex to supply the controller, he said. With an attractive price on the controller, Keating expects an increase in the floppy drive market's growth rate.

Innovex offers its drive subsystem at a lower price and with faster delivery than some minicomputer firms, he said.

In addition to a new nationwide system of representatives, the firm has also signed up distributors in western Europe, Australia, South Africa and Japan and is looking at South America, he said.

The firm signed Sirvess, Inc. for maintenance of its drives.

Market Questioned

Innovex is offering a double-density drive, although Keating said he is not sure of the validity of the market. The firm chose to offer the product to demonstrate its technical capabilities and emphasize its position in the marketplace, Keating said.

Because IBM has elected to stay away from the double-density concept on floppies, the market has been slow in developing.

Innovex plans to offer a double-sided drive that is compatible with IBM's latest floppy announcement, he said.

When IBM came out with the Model 3740 and used the term "diskette," Innovex sued IBM for infringement of its trademark. IBM settled out of court, Keating said.

The firm initially made hard sectored diskettes and drives and still serves as a source for those diskettes, he said, although it no longer makes the drives.

Innovex buys its media and then fabricates the diskettes, he added.

OEMs Surveyed

WALTHAM, Mass. – Seventeen percent of systems houses have less than 10 employees while 29% have more than 200, according to an analysis of over 1,000 systems houses and OEMs made by International Data Corp. (IDC).

IDC used its *OEM/Systems House Prospect Data File* for its analysis, which found about 35% of the firms have been in business for six years or more, 28% have been in business for three to five years and 13% have less than two years' experience.

Analysis of hardware expenditure data showed 43% of the OEM/systems house firms spend over $500,000 for mini- and microcomputers and mini peripherals, while 21% spend less than $100,000, according to IDC.

An analysis of the firms' peripheral equipment usage showed 32% of those surveyed use disk pack drives.

Orders & Installations

Southern Bankcard Corp. in Fort Lauderdale, Fla., has installed an NCR Criterion 8550 system for on-line bank customer account updating.

Ford Motor Co.'s Tractor Operations is installing a Burroughs Corp. B7700 system and nine B772 processors for inventory applications in its parts supply system.

Seattle First National Bank has ordered an expanded Incoterm Corp. 7000 on-line banking system for use at 1,100 teller locations.

The Johns Hopkins University Applied Physics Laboratory has ordered eight SEL 32/55 minicomputers from Systems Engineering Laboratories for use in a Navy weapons system program.

Southwestern States Bankcard Association has ordered 200 Model 350 flexible disk terminals and magnetic tape drives from Sycor, Inc. for use in its regional network.

Florida Power and Light Co. of Miami has ordered a Control Data Corp. energy control system consisting of two Cyber 173 systems, four System 17 controllers and associated peripherals.

The Ralph K. Davies Medical Center in San Francisco has installed an EMI Scanner CT 5005, a whole-body computerized tomography system.

Credit Systems, Inc. has installed an automatic call distribution system from Collins Commercial Telecommunications, a division of Rockwell International Corp.

Montgomery Ward has ordered a Telecommunications Accounting and Control System from TDX Systems, Inc. for installation at its Chicago corporate headquarters. The system will manage Wats and other long-distance phone lines.

The National Aeronautics and Space Administration's George C. Marshall Space Flight Center has installed an FR 80 computer output microfilm recorder from Information International, Inc.

W.A. Storing Co. of Columbus, Ohio, has installed a Mohawk Data Sciences Corp. System 2400 key-to-disk unit for its computerized letter writing and address matching service.

General Binding Corp. in Northbrook, Ill., is installing an IBM 370/145 this fall which will be replaced by a 370/148 in mid-1977. The configuration will include 3330-I and 3330-II equivalents from Memorex, Storage Technology Corp. 6,250 bit/in. tape equipment and Raytheon on-line 3270-type CRTs and controllers.

COMPUTER MANAGEMENT
United Kingdom

World rank as DP market: *Fourth*
1975 DP expenditures (1): *$2.7 Billion*
1975 imports from US (2): *$270 Million*
Rank as importer from US: *Third*

Computer Management is a monthly magazine recently purchased by Computerworld, Inc. Monthly circulation is 30,000.

COMPUTERWOCHE
Germany

World rank as DP market: *Third*
1975 DP expenditures: *$3.7 Billion*
1975 imports from US: *$274 Million*
Rank as importer from US: *Second*

Computerwoche is a weekly tabloid newspaper started by Computerworld, Inc. It has a circulation of 21,000 to the West German computer community.

SHUKAN COMPUTER
Japan

World rank as DP market: *Second*
1975 DP expenditures: *$4.6 Billion*
1975 imports from US: *$189 Million*
Rank as importer from US: *Fifth*

Shukan is a weekly tabloid newspaper, jointly owned by Computerworld and Dempa publications. Circulation is 35,000.

Zero-Un Informatique
France

World rank as DP market: *Fifth*
1975 DP expenditures: *$2.5 Billion*
1975 imports from US: *$223 Million*
Rank as importer from US: *Fourth*

Computerworld represents **Zero-Un Informatique** in the U S. Zero-Un has three publications, one a weekly tabloid newspaper with circulation of 22,000, the second a monthly magazine, circulating 13,000 copies, and a new bi-weekly, Minis and Micros. All circulate throughout Europe's French speaking computer market.

DATANEWS
Brazil

World rank as DP market: *12th*
1975 DP expenditures: *$250 Million*
1975 imports from US: *$60 Million*
Rank as importer from US: *(Est) 10th*

DataNews is a bi-weekly tabloid newspaper in Portuguese with an English-language summary. It is owned by Computerworld, Inc. and has a circulation of 7,000.

Notes:
(1) These figures are estimates of International Data Corporation, the world's largest EDP Market research firm.
(2) Import figures come from the US Department of Commerce, and include only computers and computer-related products manufactured in the United States by US firms. Many US firms also manufacture abroad, and those products are not counted.

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COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Documation Entering End-User Mart To Avoid Whims of OEM World

By Molly Upton
Of the CW Staff

MELBOURNE, Fla. – Documation, Inc. is entering the end-user market with its printer and card-handling products in order to buffer itself against the vagaries of the OEM-only world.

A big benefit of entering the end-user market, according to President Ray Halbert, is the ability to "control our own destiny."

As a straight OEM supplier, a firm has no control over its order bookings, but must depend on the OEMs' sales forces to generate demand for its equipment, he said.

Halbert hopes end-user revenues will equal those from OEM sales within 18 months, for a 50-50 ratio.

"Now I can live," he commented. "A 50% cut on 50% of the OEM volume will still leave me with 75% of my business.

"But a 50% cut last year left me with 50% of my business," he said.

'The Right Move'

"We think we've made the right move. You really aren't a truly successful company, in my estimation, until you satisfy the end customer. Then you've made it in this industry," Halbert said.

"It's easy to satisfy an engineering manager who's evaluating your product to put on his system because he's not the ultimate end user. He's the guy who reads the specs and makes sure the price and performance are there.

"You've really made it when the person in the office says, 'I like this thing. It works and I can work it,' " he said.

"Now you're a success; not everyone can do that. You've got to make all the people happy that use the equipment and that means another degree of sophistication," he added.

The firm has established sales and service offices in Boston, New York, Chicago, San Francisco, Los Angeles and Washington, D.C., Halbert said.

Documation supplies a 2,250 line/min impact printer as well as card punches and readers.

In addition, it supplies a complete printer and card I/O subsystem which, with controllers, replaces a whole unit record subsystem, he said.

Documation is the only company other than IBM to offer such a subsystem, he noted.

There isn't any competition for Documation products since most firms have given up making card gear, he said.

Decision Data Computer Corp. makes a 96-column card unit and Peripheral Dynamics, Inc. makes a card reader.

Univac, Control Data Corp. and IBM make their own units, Honeywell gets its units from its operations in France and "we supply everyone else," Halbert concluded.

Adapso Meeting Begins Oct. 25

TORONTO – "Posturing for Change" will be the theme of the Data Processing Organization's (Adapso) 45th Management Conference to be held on Oct. 25-27 at the Inn on the Park here.

The conference will include discussions on various topics of interest to the time-sharing, facility management, data center and software companies in attendance.

Session Subjects

Session topics include impact of corporate consolidation on the industry, can software companies go public, common carriers now and in the future, distributive DP and data base management.

Other subjects to be covered are managing the litigation function and systems software and its future.

Special committee reports will be made on electronic funds transfer systems, privacy and security and taxation.

International Data Corp. will present studies on the computer services industry and office systems evolution.

Registration costs are $175 for member companies and $275 for nonmember companies. Adapso is at 210 Summit Ave., Montvale, N.J. 07645.

Telefile Gives Grants To Calif. University

IRVINE, Calif. – Telefile Computer Products, Inc. has awarded five grants totaling $2,500 to the Electrical Engineering Department of California State University at Long Beach.

The grants were presented to the school to encourage research in the fields of biomedical engineering, electrical power systems, solid-state electronics, hybrid circuitry and optical communications studies, according to Joe Letbetter, vice-president of operations.

CLA Honors Strong

WASHINGTON, D.C. – Robert W. Strong, manager of management information systems for Brockway Glass Co. in Brockway, Pa., has been named Executive of the Year by the Computer Lessors Association (CLA).

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Due to expansion of staff, the NCR Corporation has openings for Systems Analysts in its Corporate Headquarters organization located in Dayton, Ohio. A college degree and specific experience in the design, programming, and installation of accounting, financial reporting and general business systems are required. Successful candidates will possess outstanding communications skills, both written and oral. An MBA or MS in Computer Science would be a plus.

These positions offer the opportunity to work with the latest computer design techniques, including data base management systems and telecommunications access methods, and lead to rapid advancement, either in the internal systems organizations or to positions in product software development.

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NCR

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West Coast: Los Angeles (213/386-5500), Irvine, CA. (714/833-1730), Palo Alto (415/328-7155), San Francisco (415/434-2410).

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Henrico County, a suburban County adjacent to Richmond, Virginia, is seeking two Senior Systems Professionals who have demonstrated their ability to assume responsibility for systems and documentation activities.

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These positions are top level supervisory positions reporting to the Manager of Data Processing Services.

Please send a resume giving full employment and salary history to County of Henrico, Personnel Office, P.O. Box 27032, Richmond, Virginia 23273. An Equal Opportunity Employer.

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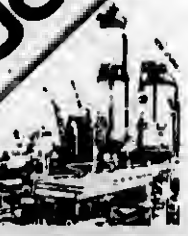

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MIS

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Send resume, salary history and the names of three references to Robert J. Carey, Asst. Superintendent-Business Services, Yuba Community College District, 2088 N. Beale Rd., Marysville, CA 95901 before October 15, 1976.

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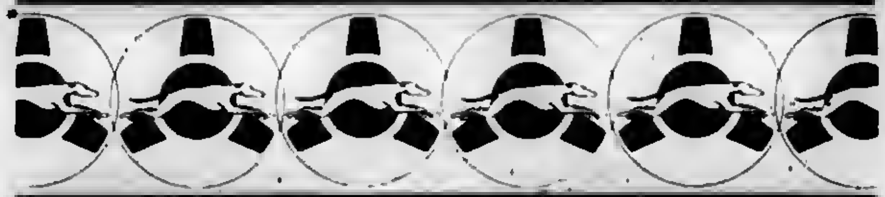

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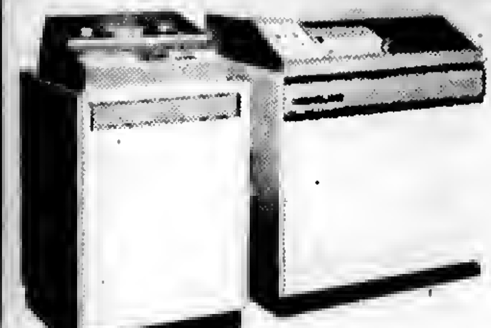

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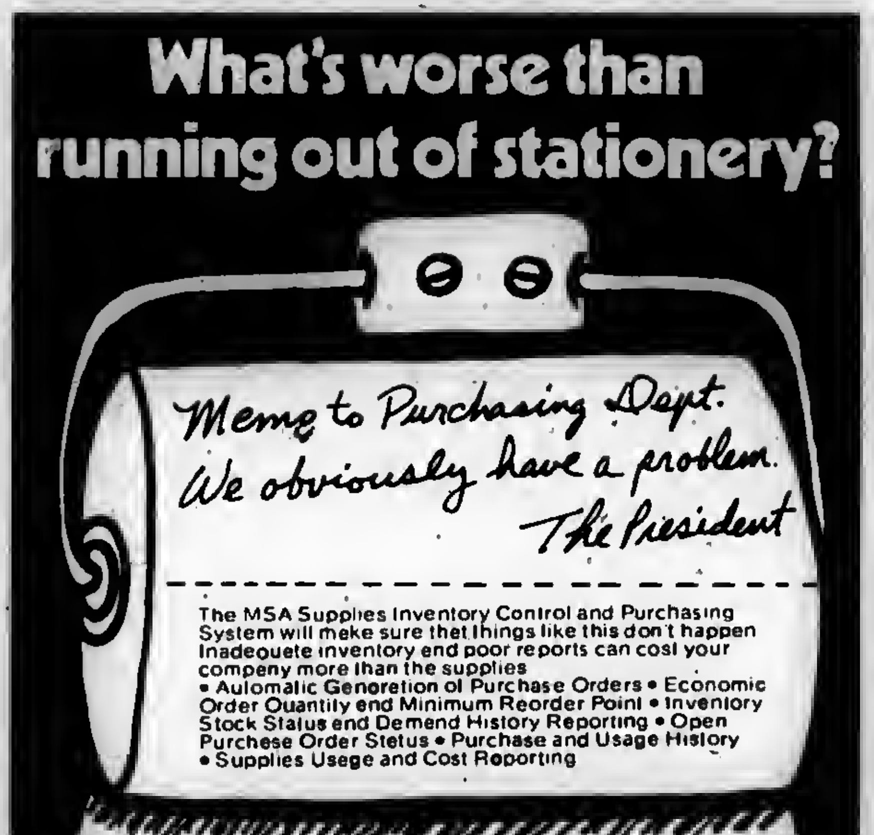

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FORT LAUDERDALE, Fla. – Recuperating from a loss in fiscal 1975, Systems Engineering Laboratories, Inc. (SEL) finished out fiscal 1976 with a profit.

SEL also showed a profit for the last quarter compared with the year-ago period.

Fourth-quarter earnings totaled $403,285 or 15 cents a share compared with a loss of $32,732 in the year-ago period.

Revenues for the period were $6.3 million compared with $4.2 million in the fourth quarter of 1975.

Year earnings totaled $59,389 or 2 cents a share, including a $197,860 tax credit, compared with a 1975 loss of $321,889, including a $135,871 tax credit.

Revenues for the year were $20 million compared with nearly $17.5 million last year.

Keydata Doubles Earnings in Year With Small Increase in Revenues

WELLESLEY, Mass. – Keydata Corp.'s year-end earnings more than doubled last year's despite little change in revenues.

Earnings for 1976 climbed to $1.1 million or 40 cents a share, including a $515,000 tax credit, compared with $452,000 or 17 cents a share, including a $200,000 tax credit, last year.

Revenues for the year were $14.9 million compared with $13.5 million in 1975.

"While our fiscal 1976 financial performance is gratifying and enhances our confidence in the future, fiscal 1977 will, nonetheless, be a challenging year for the company," President L. Edwin Donegan Jr. stated.

"Sales during the last six months of fiscal 1975 and the first half of fiscal 1976 were below plan, but in the second half of fiscal 1976 they recovered sharply.

"However, the recent rebound in bookings will not make a significant contribution to revenue until the second half of fiscal 1977," he noted.

"Thus, a modest revenue decline is anticipated during the first six months of fiscal 1977 compared with the first half of the preceding year," Donegan said.

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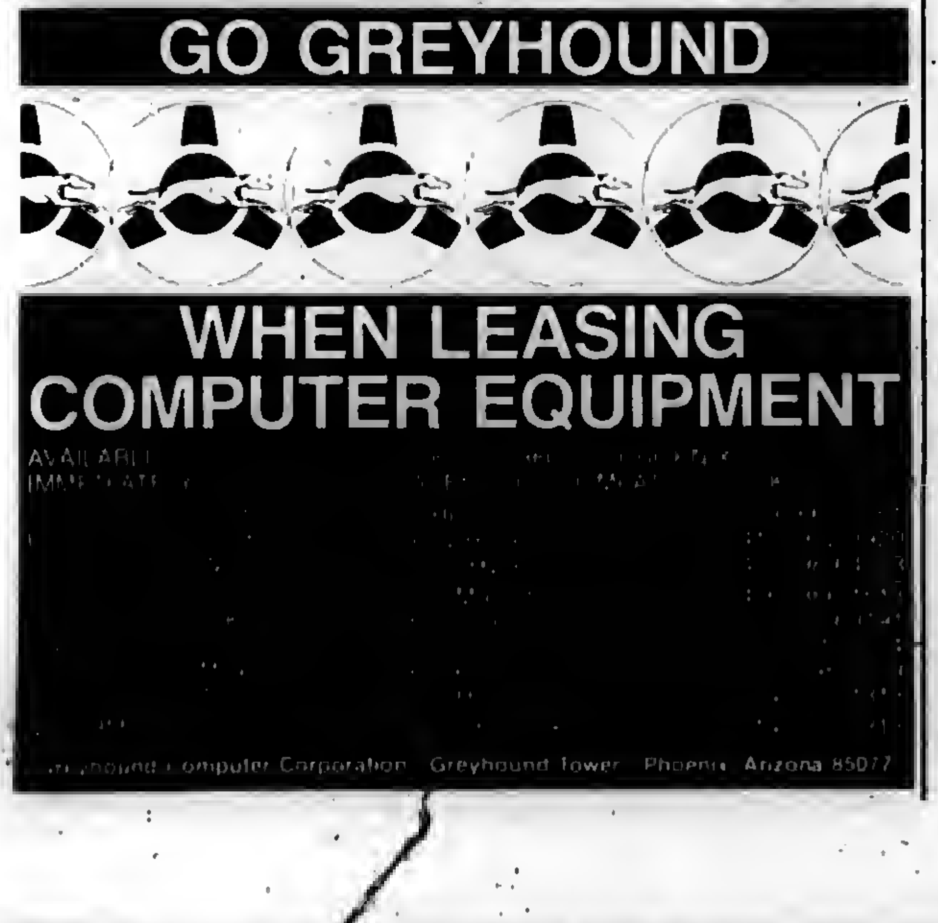
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Prime Earnings Up 286% in Half-Year

FRAMINGHAM, Mass. – Prime Computer, Inc. continued on target toward its goal of $18 million in sales for the year as its second-quarter and six-month results showed sizable improvements over the year-ago figures.

Earnings rose 180% and 286% for the quarter and six months respectively.

The maker of minicomputers showed earnings for the quarter of $442,000 or 20 cents a share, including a tax credit of $198,000, compared with the year-ago $157,000 or 8 cents a share, which included a $74,000 tax credit.

Revenues for the three months totaled $4.8 million, up 79% over the $2.7 million reported in the same period last year.

During the six months, earnings rose to $807,000 or 36 cents a share, including a $375,000 tax credit, compared with $209,000 or 10 cents a share in the same period last year, when there was a tax credit of $100,000.

During the first quarter, the firm doubled its worldwide sales force to accommodate plans for increased penetration of Fortune 1,000 companies that are multinational in scope, according to President Kenneth G. Fisher.

Nearly 50% of the company's business is international in nature, he said.

Two years ago, the average unit price of a system was $15.000 to $20,000; the majority of Prime's quotes today are in the $150,000 range, Fisher said, adding this indicates the shift in emphasis to software which reflects longer product life cycles.

The firm plans to introduce its Transact series this fall.

Comsat Posts Decreased Earnings In Six Months and Second Quarter

WASHINGTON, D.C. – Communications Satellite Corp.'s (Comsat) second-quarter and six-month earnings were below those of the year-ago periods.

A change in accounting at the direction of the Federal Communications Commission (FCC) caused a $1.1 million reduction in earnings for the second quarter.

During the quarter, the firm's earnings dipped to $10.8 million or $1.08 a share compared with $11.6 million or $1.16 a share in the year-ago period.

Revenues for the quarter rose to $39.4 million compared with $34.5 million in the same period last year.

In the six months, earnings dropped to $21.9 million or $2.19 a share compared with $24.3 million or $2.43 a share in the year-ago period.

Revenues reached $76.7 million compared with $71.1 million in the 1975 half-year.

If the accounting order had not been in effect during any part of the second quarter, Comsat said, its earnings would have been $1.19 a share. If it had been in effect the entire quarter, earnings would have been 56 cents a share.

The firm said it is continuing to collect its present rates from its common carrier customers and is putting in an escrow account the difference between these amounts and those reported as revenues on the basis of "informational" tariffs as determined by the FCC.

Tally Net Soars 700% in Half-Year And Quadruples in Second Quarter

KENT, Wash. – Tally Corp.'s six-month earnings surged upward more than 700% and second-quarter earnings soared 400% compared with the year-ago periods.

In the quarter, earnings jumped to $942,000 or 27 cents a share, including a $401,000 tax credit, compared with $205,000 or 9 cents a share with a $20,000 tax credit in the year-ago period.

Revenues for the quarter were nearly $7.2 million compared with $5.4 million for the 1975 quarter.

For the six months, earnings grew to $1.6 million or 46 cents a share, including a $779,000 tax credit, compared with $233,000 or 10 cents a share, including a $55,000 tax credit, in the 1975 half-year.

Revenues for the period rose to $13.3 million compared with $9.9 million in the year-ago period.

Tally attributed the marked improvement in results to significant growth in the industries the firm serves, continued product cost reductions and reduction of foreign currency exchange losses to $23,000 from $165,000, incurred in the first quarter.

"We remain confident the third and fourth quarters will also be good," President Leslie A. Larsen said.

"The T1000 and T4000 lines will be shipping in significant quantities with the lower margins normally associated with new product introductions.

"The short-term backlog is strong, but some decline in our long-term backlog has prompted us to make some marketing changes," he said.

Nickels & Dimes

Alpex Computer will receive $11 million in settlement of its lawsuit against Pitney-Bowes.

$ $ $

Mohawk Data Sciences has consummated a multicurrency credit agreement with a group of banks. The commitment is fixed initially at $63 million, declining on a scheduled basis to $40 million on and after May 1, 1979.

$ $ $

National CSS declared a dividend of 5 cents a share payable Sept. 1 to holders of record Aug 16.

$ $ $

Western Peripherals declared a dividend of 1 cent per share payable Aug. 2 to holders of record July 9.

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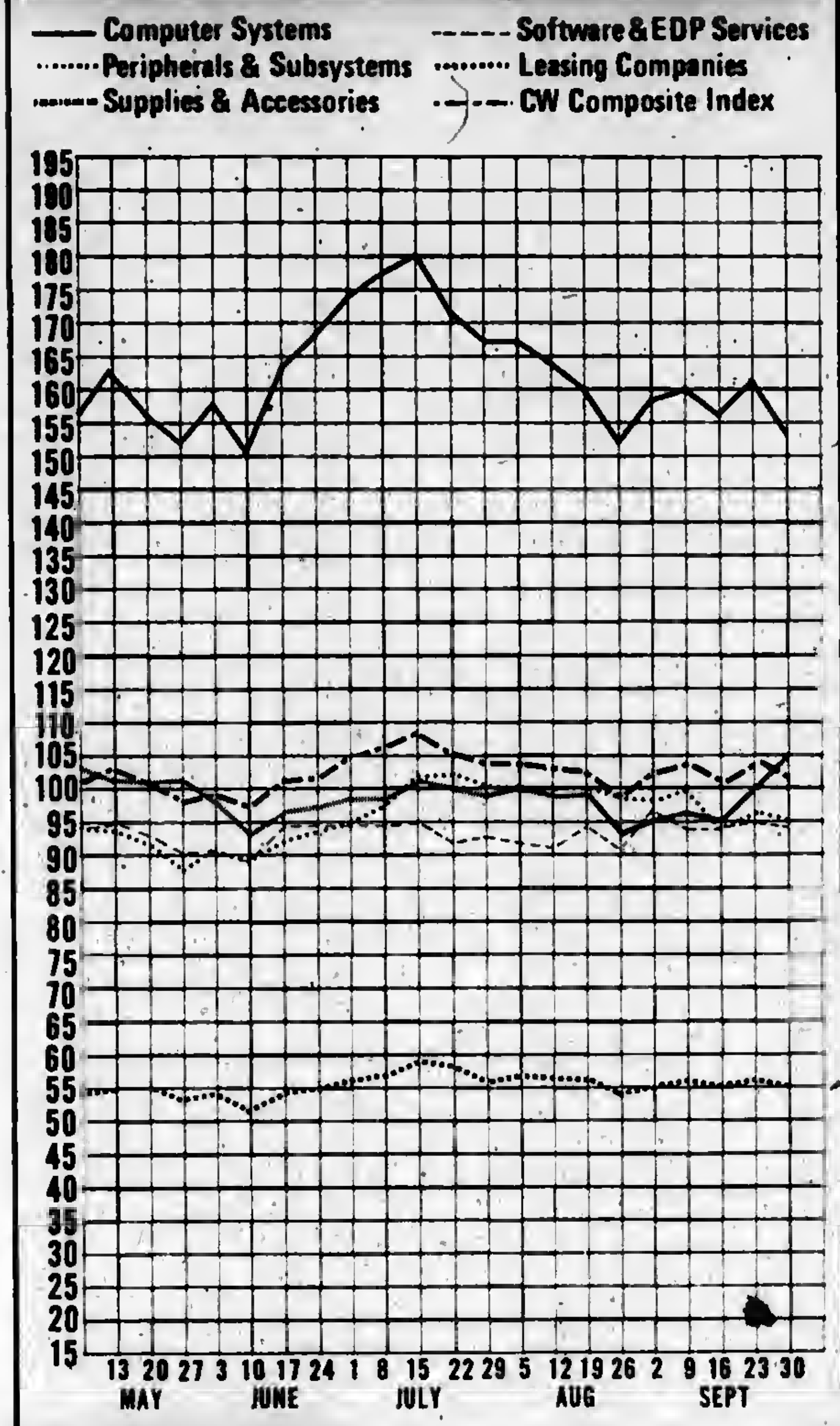
COMPUTERWORLD Computer Stock Trading Indexes



Earnings Reports

MOSTEK
Three Months Ended July 2

	1976	1975
Shr Ernd	$.21	.....
Revenue	13,493,818	$9,036,250
Earnings	901,249	(981,333)
6 Mo Shr	.35	.....
Revenue	26,067,549	23,999,145
Earnings	1,481,539	(639,829)

NATIONAL DATA
Year Ended May 31

	1976	1975
Shr Ernd	$.38	$.36
Revenue	32,946,000	31,277,000
Earnings	1,923,000	1,890,000
3 Mo Shr	.12	.08
Revenue	8,245,000	8,086,000
Eernings	579,000	394,000

NATIONAL SEMICONDUCTOR
Year Ended May 31

	1976	1975
Shr Ernd	$1.44	$1.34
Revenue	325,097,000	235,457,000
Earnings	18,953,000	16,748,000
3 Mo Shr	.34	.33
Revenue	88,166,000	57,160,000
Eernings	4,498,000	4,295,000

NUCLEAR DATA
Three Months Ended May 31

	1976	a1975
Shr Ernd	$.31	$.17
Revenue	4,385,350	3,515,823
Tax Cred	147,000	51,000
Earnings	249,463	146,445

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TAB PRODUCTS
Yeer Ended May 31

	1976	1975
Shr Ernd	$1.40	$1.63
Ravenue	37,500,000	35,824,000
Eernings	1,170,000	1,358,000
3 Mo Shr	.57	.28
Revenue	10,850,000	8,631,000
Earnings	475,000	230,000

TRACOR
Three Months Ended June 30

	1976	1975
Shr Ernd	$.65	$.59
Ravenue	31,727,000	26,181,000
Tax Cred	486,000	755,000
Earnings	1,698,000	1,460,000
6 Mo Shr	1.31	1.05
Revenue	59,579,000	49,176,000
Tex Cred	1,138,000	1,283,000
Earnings	3,396,000	2,583,000

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESOAY, SEPTEMBER 29, 1976

All statistics compiled, computed and formatted by
TRADE★QUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		1976 RANGE 111	CLOSE SER 29 1976	WEEK NET CHNGE	WEEK RCT CHNGE
N	RURROUGHS CORR	84-108	92 3/4	-2 3/4	-2.8
O	CONRUTER AUTONATION	10- 19	15 5/8	-2	-11.5
N	CONTROL OATA CORP	18- 27	23 1/2	- 3/8	-1.5
N	OATA GENERAL CORR	40- 60	45 5/4	-1 1/2	-5.1
O	OATAPOINT CORR	24- 46	51 1/2	+ 1/4	+0.7
O	DIGITAL CONP CONTROL	2- 7	5 7/8	- 3/4	-11.5
N	OIGITAL EQUIPNENT	138-181	158	-4 3/4	-2.9
N	ELECTRONIC ASSOC.	2- 5	2 5/4	+ 1/8	+4.7
A	ELECTRONIC ENGINEER.	7- 16	9	- 5/4	-7.6
N	FOXBRO	28- 50	48	-1	-2.0
C	GENERAL AUTOMATION	5- 11	4 5/4	-1	-17.5
O	GRI COMPUTER CORR	1- 1	3/4	- 1/8	-14.2
N	HEWLETT-PACKARO CO	85-117	95 1/8	-1 7/8	-1.9
N	HONEYWELL INC	54- 56	45 5/8	-2 1/8	-4.4
N	IBM	227-288	281 1/2	-4	-1.4
C	HANAGEMENT ASSIST	1- 3	1 1/2	-	-5.8
O	HEMOREX	18- 33	20 7/8	-1 7/8	-8.2
O	HICROOATA CORR	10- 28	25 1/4	-1 3/4	-6.4
O	HOOULAR COHRUTER SYS	4- 14	4 1/2	+ 1/4	+5.8
N	NCR	24- 37	34 1/2	-2 3/8	-6.4
O	RRIHE COHRUTER INC	4- 14	11 5/4	- 1/2	-4.0
N	PERKIN-ELMER	19- 27	22 7/8	0	0.0
N	RAYTHEON CO	45- 67	63 7/8	-2 7/8	-4.5
N	SPERRY RANO	40- 52	48 1/4	-1 1/2	-5.0
O	SYCOR INC	13- 51	12 1/2	-1 1/4	-9.0
A	SYSTENS ENG. LABS	6- 10	6 5/8	- 1/4	-5.6
N	VARIAN ASSOCIATES	13- 17	14 1/8	- 5/8	-2.5
A	WANG LABS.	11- 20	15 1/2	-1 1/8	-6.7

LEASING COMPANIES

EXCH		1976 RANGE 111	CLOSE SER 29 1976	WEEK NET CHNGE	WEEK RCT CHNGE
O	CONOISCO INC	5- 10	7 1/2	0	0.0
A	COMNERCE GROUP CORR	2- 5	2	- 1/8	-5.8
A	CONRUTER INVSTRS GRR	1- 5	1 5/8	- 1/8	-7.1
N	OATRONIC RENTAL	1- 8	1	+ 1/8	+14.2
A	OCL INC	1- 1	5/8	0	0.0
N	ORF INC	5- 8	6 7/8	- 1/4	-3.5
N	ITEL	6- 15	12 5/8	- 5/8	-4.7
N	LEASCO CORP	6- 19	16 1/4	- 3/4	-4.4
O	LEASPAC CORP	0- 1	1/4	0	0.0
C	NRG INC	0- 1	5/8	0	0.0
A	PIONEER TEX CORP	6- 9	7 3/8	+ 1/8	+1.7
N	U.S. LEASING	7- 12	9 1/2	- 1/4	-2.5

EXCH: N=NEW YORK: A=AMERICAN: P=RHIL-BALT-WASH
L=NATIONAL: N=MIOWEST: O=OVER-THE-COUNTER
O-T-C PRICES ARE BIO RRICES AS OF 3 P.N. OR LAST BIO
111 TO NEAREST OOLLAR

SOFTWARE & EDP SERVICES

EXCH		1976 RANGE 111	CLOSE SER 29 1976	WEEK NET CHNGE	WEEK RCT CHNGE
O	ADVANCEO COMR TECH	1- 5	1 1/2	- 1/4	-14.2
O	ANACOMP INC	6- 11	7 1/8	- 1/4	-3.3
A	APPLIEO OATA RES.	2- 4	5 1/4	- 5/4	-18.7
N	AUTOMATIC OATA PROC	1T- 35	31 1/4	- 5/4	-2.5
O	COLENAN AMERICAN COS	2- 6	2	- 1/2	-20.0
O	COMRUTER OIMENSIONS	5- 7	5 5/4	+ 1/2	+9.5
O	COMR ELECTION SYSTMS	5- 9	5 1/4	- 5/4	-12.5
O	COMRUTER HORIZONS	1- 2	1 1/2	+ 1/4	+20.0
O	COMPUTER NETWORK	2- 6	5	- 1/4	-4.7
N	COMPUTER SCIENCES	4- 8	6 1/8	- 1/4	-5.9
O	COMPUTER TASK GROUR	1- 1	1 1/2	+ 1/2	+50.0
O	COMRUTER USAGE	5- 6	5 1/4	+ 1/4	+8.5
C	COMSHARE	2- 9	5 1/4	0	0.0
O	OATA OIMENSIONS INC	2- 4	2 7/8	+ 1/4	+9.5
O	OATATAB	1- 1	1 5/8	0	0.0
N	ELECTRONIC OATA SYS.	12- 18	15 1/2	0	0.0
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	INSYTE CORP	1- 5	1 3/8	- 1/4	-15.3
C	IRS CONPUTER NARKET.	1- 2	1 1/8	0	0.0
O	KEANE ASSOCIATES	2- 4	2 1/4	0	0.0
O	KEYOATA CORP	2- 5	1 1/2	- 1/8	-7.6
O	LOGICON	5- 4	5 5/8	+ 1/4	+7.4
A	NANAGEMENT OATA	1- 5	2 5/8	- 3/8	-15.6
A	NATIONAL CSS INC	13- 25	20 5/8	- 1/2	-2.5
A	ON LINE SYSTEMS INC	18- 22	17 7/8	-2 1/8	-10.6
N	PLANNING RESEARCH	5- 5	5 3/4	- 1/4	-6.2
O	RROGRAHHING & SYS	1- 1	5/8	0	0.0
O	RAPIOATA INC	2- 5	1 5/4	- 5/8	-17.6
O	REYNOLOS & REYNOLO	13- 21	16	+1 1/4	+8.4
O	SCIENTIFIC COMPUTERS	1- 1	1 1/8	+ 1/8	+12.5
O	TYMSHARE INC	17- 28	18	+ 5/4	+4.5
A	URS SYSTEMS	5- 5	5 7/8	0	0.0
N	WYLY CORP	2- 7	1 1/2	- 1/4	-14.2

PERIPHERALS & SUBSYSTENS

EXCH		1976 RANGE 111	CLOSE SER 29 1976	WEEK NET CHNGE	WEEK RCT CHNGE
N	AOORESSOGRAPH-NULT	8- 15	10 7/8	+ 1/4	+2.3
O	ADVANCEO HEMORY SYS	4- 10	6 5/8	0	0.0
N	AHPEX CORP	5- 10	6 7/8	- 5/8	-8.3
O	ANOERSON JACOBSON	2- 4	2 7/8	0	0.0
C	ARPLIEO OIG OATA SYS	13- 25	20 1/4	+ 1/2	+2.5
O	REEHIVE MEOICAL ELEC	5- 9	8 7/8	- 1/8	-1.5
A	BOLT, BERANEK & NEW	7- 11	8 1/4	- 3/8	-4.3
N	BUNKER-RAHO	5- 10	7 1/4	- 1/2	-6.4
A	CALCOMP	4- 7	4 1/2	0	0.0
O	CAMBRIOGE NENORIES	0- 6	5/8	0	0.0
N	CENTRONICS DATA COMR	20- 56	53 5/8	- 7/8	-2.5
O	COOEX CORR	22- 42	52	-3	-8.5
O	COGNITRONICS	1- 1	5/4	- 1/8	-14.2
O	CONRUTER CONMUN.	1- 6	5 3/4	- 5/4	-11.5
O	COMRUTER CONSOLES	4- 7	4 1/2	0	0.0
A	COMPUTER EOUIPMENT	1- 3	1 5/4	0	0.0
O	COMPUTER TRANSCEIVER	1- 5	1	0	0.0
O	COMTEN	4- 9	8 1/4	- 1/4	-2.9
N	CONRAC CORP	20- 25	22 1/2	- 5/8	-1.6

EXCH		1976 RANGE 111	CLOSE SEP 29 1976	WEEK NET CHNGE	WEEK RCT CHNGE
O	OATA ACCESS SYSTENS	1- 4	4 3/4	0	0.0
O	OATA 100	7- 13	9	+ 1/2	+5.8
A	DATA PROOUCTS CORR	5- 15	12 5/4	+ 1/8	+0.9
O	OATA TECHNOLOGY	1- 2	1 3/8	- 1/4	-15.5
O	OATUM INC	1- 2	1 1/4	- 1/8	-9.0
O	OECISION OATA COMPUT	1- 4	1 1/2	+ 1/4	+20.0
O	OELTA OATA SYSTENS	1- 1	3/4	0	0.0
N	ELECTRONIC N & H	1- 4	5 5/8	- 1/8	-5.5
O	FABRI-TEK	1- 1	5/8	0	0.0
O	GENERAL COHRUTER SYS	1- 2	7/8	- 1/8	-12.5
N	HAZELTINE CORR	4- 12	8 1/2	- 1/4	-2.8
N	HARRIS CORP	54- 55	52 1/2	0	0.0
A	INCOTERM CORP	9- 20	11 5/4	+ 1/8	+1.0
O	INFOREX INC	5- 7	5	0	0.0
O	INFORMATION INTL INC	10- 18	12 1/4	+ 1/8	+1.0
O	INTEL CORP	59-109	59 1/2	-5 1/2	-5.5
A	LUNOY ELECTRONICS	5- 7	3 3/4	0	0.0
O	MSI OATA CORP	5- 7	5 7/8	0	0.0
A	MILGO ELECTRONICS	15- 21	17 5/8	- 5/8	-3.4
N	MOHAWK OATA SCI	5- 10	7 5/8	- 3/8	-4.8
O	PENRIL CORR	1- 3	2	0	0.0
A	PERTEC CORP	3- 8	6 5/4	- 3/8	-5.2
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
C	PRECISION INST.	3- 10	3	0	0.0
O	OUANTOR CORP	4- 6	4 1/8	0	0.0
O	RECOGNITION EQUIR	6- 11	9 1/8	- 1/8	-1.3
N	SANOERS ASSOCIATES	6- 11	9 1/8	- 3/8	-5.9
O	SCAN OATA	2- 4	1 5/4	- 1/8	-6.6
O	STORAGE TECHNOLOGY	9- 15	10 7/8	-1	-8.4
O	T RAR INC	5- 10	5 3/4	- 1/8	-2.1
O	TALLY CORR.	4- 6	4	- 1/4	-5.8
O	TEC INC	3- 6	6 1/4	+ 1/2	+8.6
N	TEKTRONIX INC	45- 69	65	-2	-2.9
N	TELEX	2- 5	2 7/8	- 1/8	-4.1
O	WANGCO INC	11- 22	21 1/8	0	0.0
O	WILTEK INC	2- 2	2 3/4	+1	+57.1

SUPRLIES & ACCESSORIES

EXCH		1976 RANGE 111	CLOSE SEP 29 1976	WEEK NET CHNGE	WEEK RCT CHNGE
O	AOVANCEO SYSTEMS INC	1- 4	5 1/4	0	0.0
O	BALTIMORE BUS FORMS	5- 5	5 5/8	+ 5/8	+20.8
A	RARRY WRIGHT	6- 10	9 3/8	+ 1/4	+2.7
O	CYBERNATICS INC	1- 1	1/2	0	0.0
A	OATA DOCUMENTS	25- 44	44	+15 1/8	+42.5
O	OURLEX PRODUCTS INC	13- 24	14 1/2	+1	+7.4
N	ENNIS BUS. FORMS	6- 8	6 1/4	0	0.0
O	GRAHAN HAGNETICS	8- 13	9 5/4	- 3/4	-7.1
O	GRAPHIC CONTROLS	13- 19	16 1/2	- 1/4	-1.4
N	3M COMPANY	53- 66	64 3/4	-1 3/8	-2.0
C	MOORE CORP LTO	35- 51	35	- 1/4	-0.7
N	NASHUA CORP	11- 18	17 1/2	- 1/4	-1.4
O	STANOARO REGISTER	15- 19	16 3/4	+ 1/2	+3.0
O	TAB PRODUCTS CO	5- 11	10	- 1/4	-2.4
N	UARCO	20- 25	20	- 1/8	-0.6
A	WABASH MAGNETICS	4- 9	8	+ 3/4	+10.5
N	WALLACE BUS FORNS	19- 25	22 1/2	+ 1/8	+0.5

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43

NEWSPAPER

Vendors Move To Compete With 138, 148

By Molly Upton
Of the CW Staff

After IBM introduced its lower priced, more powerful 370/138 and 148, other vendors responded with comparable adjustments.

As a result, users can now consider mid-range systems that typically have a price spread of only $100,000 between IBM and the leading competitors.

This is, in some cases, 50% less than those that existed before IBM introduced the systems last summer.

A look at Burroughs, Univac, IBM, Honeywell, Control Data Corp. and NCR offerings reveals some leapfrogging in prices as many sallied forth with their lower cost MOS memories to combat IBM's lower price umbrella with its 370/168 and 148.

Other manufacturers introduced new products and some enhanced their machines' performances.

Although, as one industry source pointed out, IBM normally offers more for increased cost when it brings out a new product, this time IBM offered more for less.

As *EDP Industry Report* observed during the summer, what had been the ceiling (in prices with the 370/135 and 145) became the floor (with 370/138 and 148 prices).

However, Univac rallied and realigned its product offerings. It gave many of them extended memory and lowered system prices; it also lowered the CPU prices on at least one model [CW, Aug. 30].

Only a week later, Burroughs unveiled its lower memory prices which reduced the price tags on its B2800, 3800 and 4800.

Last week, Honeywell took several steps to increase the price/performance ratio of its 60 series.

(Continued on Page 6)

Itel to Unveil Own '158'

By Ronald A. Frank
Of the CW Staff

SAN FRANCISCO -- Itel Corp. this week will unveil a large CPU described as "100% hardware and software plug-compatible" with the IBM 370/158.

Called the Advanced System/5 (AS/5), the Itel machine will operate with existing IBM software and is said to provide some hardware features not available on the Model 158. The CPU will reportedly be available on both a purchase or long-term lease plan.

Although exact prices have not yet been quoted, the machine is expected to be priced "competitively" with comparable IBM CPUs. First deliveries have been scheduled for early next year, sources said.

The AS/5 is expected to be the first of an Itel family of machines. AS/4, plug-compatible with the 370/148, is also scheduled for introduction, the sources said.

Six configurations reportedly will be introduced within the AS/4 and AS/5 series. One of the AS/4 systems is believed to have "1.4 times the power of a 370/148 or .7 times the power of a basic 370/158," sources reported.

The AS/5-3 is designed to compete with the 370/158-3 and reportedly has 1.8 times the power of a basic

(Continued on Page 2)

Unusual 'Gag Order' Put On Calcomp vs. IBM Data

By E. Drake Lundell Jr.
Of the CW Staff

LOS ANGELES – Much of the important evidence to be entered in the California Computer Products, Inc. (Calcomp) vs. IBM antitrust case starting here next month may never be made public if a "gag order" signed by Judge Ray McNichols is allowed to remain in effect.

The order is designed to protect all the parties in the current crop of cases against IBM – Calcomp, Memorex, Sanders, Forro Precision, Transamerica and Hudson Leasing, as well as IBM – from having to publicly expose future business plans or trade secret information to other competitors or to the public.

However, as the order is written, it allows any party to the case to "designate" any materials as "nonpublic" without having to prove those materials are, in fact, proprietary business or trade secret information.

Therefore, any of the litigants can claim any document that is damaging to its case should be nonpublic and that request will be honored by the court unless challenged by another party to the case, which is highly unlikely.

And it is happening: "There have been and are many documents filed as nonpublic," a clerk with the court said last week.

To protect the parties from competitive disclosure, the first paragraph of the order states "nonpublic documents or information obtained by discovery in these cases . . . shall not be used by the parties to these proceedings for business or competitive purposes or for any purpose whatever other than for the preparation and trial of these cases . . ."

(Continued on Page 3)

Another Election Year Casualty

House Unit Kills Grants Data Base

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. – The idea was to make a data bank on federal assistance programs the single national source of funds available for the civic projects of states, counties and local governments.

But it was an idea whose time had not yet come. The bill that would have made the data bank a reality became just another election year casualty last week when the House Government Operations Committee refused to bring the bill to the House floor.

But there may be enough interest in such a bill in the House that could carry it all the way through Congress next year. Rep. Charles Rose (D-N.C.), chairman of the House Subcommittee on Computers, expressed enthusiasm for the concept at the National Computer Conference and many other public forums this year [CW, June 28].

Nevertheless, on Sept. 30, the General Services Administration (GSA) ended its four-city, three-month test of "Project First," a data bank of grants for rural areas developed by the U.S. Department of Agriculture [CW, Sept. 20].

The system is now known as the Federal Assistance Program Retrieval System (FAPRS).

"While Project First was successful, it wasn't as successful as we hoped it would be," a GSA spokesman said, adding "FAPRS was really only part of the test. We were trying to determine what impact terminals will have on the GSA's federal information centers."

Thus far, FAPRS seems to have been used to a greater extent in Los Angeles, where the Southern California Association of Governments spread the word, the spokesman said.

The project was "less successful" in Philadelphia, but the Pennsylvania Department of Agriculture's Bureau of Rural Affairs already offers FAPRS to the state's cities and towns free of charge, he noted.

"Computer use is new to most of us in this organization and terminal use is much simpler than we thought it would be," the spokesman said.

While GSA tests FAPRS and becomes familiar with computer use, the Office of Management and Budget (OMB) is reserving its opinion on the project. It is continuing to believe, however, many people

(Continued on Page 2)

Ford Signs Tax Act With SSN Identifier

WASHINGTON, D.C. – The Tax Reform Act of 1976, signed into law by President Gerald R. Ford last week, expands use of the Social Security number (SSN).

States and local governments can now use the SSN as an identifier for tax administration purposes, in general public assistance programs, for drivers' licenses and for motor vehicle registration.

The law reverses the section of the Privacy Act of 1974 that prohibits government agencies from denying rights and privileges to individuals who refuse to provide their SSNs [CW, Aug. 2].

Government employees who disclose the number without authorization or otherwise misuse the SSN could be guilty of a misdemeanor, punishable by a fine of up to $1,000 or by a prison term of up to one year.

Congressman Warns OTP Head Against Influencing AT&T Suit

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – The White House Office of Telecommunications Policy (OTP) may be trying to influence the Justice Department's antitrust suit against AT&T, according to Rep. Timothy Wirth (D-Colo.).

In a letter last week, Wirth cautioned OTP Director Thomas Houser about public statements made concerning the antitrust suit. Houser had issued a statement in late August questioning whether the Justice Department suit had been adequately researched, especially in the area of economic justification.

"Further statements on your part might be interpreted as an attempt by the White House to influence the litigation," Wirth said in his letter.

"I strongly recommend that there be no further communication between your office and the Justice Department regarding the AT&T litigation. . . I feel it would be unwise for you to be personally involved because of your prior association with Sidley and Austin, which as you indicated is one of several [law] firms representing the telephone company in the antitrust action," Wirth said.

The letter to Houser was an outgrowth of testimony given by Houser and Donald Baker, U.S. Assistant Attorney General, at the recent hearings on the Consumer Communications Reform Act held by the House Subcommittee on Communications. Wirth is a member of the subcom-

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House Unit Kills Data Base Bill

(Continued from Page 1)

are simply too enamored with this kind of technology.

The OMB administers many of the grant and loan plans included in the FAPRS data bank. The OMB is also responsible for publishing the "Catalog of Federal Domestic Assistance," a 1,100-page manual that could be phased out if the computerized version is adopted.

In the hearings on the various versions of the Senate bill last March, Paul H. O'Neill, OMB deputy director, maintained Congress should make no new laws in the area of information on federal assistance programs.

Instead, he argued, the OMB and Congress should continue "as we have in the past to work together to add information to the catalog," he argued.

The catalog is available on magnetic tape for those who want to use a search program on it, he stressed.

Last week, Dale McOmber, OMB assistant director for budget review, reinforced the position taken by O'Neill: "Any intelligent person can use the catalog and do what FAPRS does," he said.

O'Neill was hit hard at Senate hearings on the bill for suggesting state and local governments spend their own money if they want to find out what federal funding might be available to them.

The senators considered it appalling that some 20 states find it necessary to have representatives here whose primary duty in many cases is to sniff out grants.

They also noted the catalog is frequently out of date and doesn't tell state and local officials what they really need to know: Is the program currently funded and does their community meet its eligibility requirements?

FAPRS answers the questions, according to its creator, Paul R. Kugler, who heads the plans and programs staff of the Rural Development Service in the Department of Agriculture.

It would also help to spread grant funds around from the large, well-endowed cities and universities to the smaller towns and colleges, he said.

Kugler doesn't think the catalog is enough. "People in this country have a right to know where their tax dollars are available to meet their basic needs. That's what democracy's all about. This system does that."

FAPRS Ends Orbosonia's Search

WASHINGTON, D.C. – Orbosonia, Pa., a town of 550, had outgrown the double-wide mobile home that served as its medical center, but eight months of searching through catalogs of federal assistance programs revealed no federal funds for medical facilities.

Finally, however, with the help of the computerized Federal Assistance Program Retrieval System (FAPRS), $460,000 was located by the Pennsylvania Department of Agriculture's Bureau of Rural Affairs.

FAPRS, developed by the U.S. Department of Agriculture, was in its test phase then, and on a chance the Bureau of Rural Affairs used the data bank to help Orbosonia apply for funds.

Another $40,000, raised by the Lion's Club, Kiwanis Club and Junior Chamber of Commerce of the town, will help pay for a new center, he added.

Because of its success in helping Orbosonia find funds with FAPRS, the Bureau of Rural Affairs has arranged for this service for all of Pennsylvania, the spokesman said.

Wirth Warns OTP on Bell Suit

(Continued from Page 1)

mittee.

During Houser's appearance, Wirth questioned the OTP director on why he had visited Baker in the Justice Department to discuss the antitrust case.

Houser held a press conference on Aug. 25 at which he cast doubt on the Justice Department suit. After the public statements by Houser, Baker told the subcommittee he called Houser. "I had a duty to make him understand the case," Baker said.

"If he had the notion this was a random frolic, I wanted to let him know how the world really was," Baker told Wirth during the hearings.

According to Baker, Houser visited Baker's office on Sept. 2, explaining he wanted to know the "economic rationale" for the suit.

"I discussed with Houser the process the Justice Department had gone through before the antitrust case was filed," Baker said. "I did not want him to see documents on the case," hut he gave orders Houser should talk to the chief economist working on the litigation, Baker said.

Earlier, Wirth had asked Houser about his involvement with Sidley and Austin. Houser said he had been a partner in the Chicago law firm, but added he had never worked on the AT&T case.

Wirth asked Houser if it was not common practice for partners in a law firm to share in clients' fees and Houser indicated it was.

Houser said he essentially regarded telecommunications as a non-partisan area of interest. Because of this the Administration has taken a position on the antitrust litigation, the OTP chief said.

Late last week OTP had not received Wirth's letter and Houser could not comment on the situation, an OTP spokeswoman said.

Itel '158' Debuting This Week

(Continued from Page 1)

370/158, according to an industry source. Multiprocessor configurations will also be introduced, sources indicated.

Both CPUs will be built by National Semiconductor Corp. and are believed to use a bipolar memory that is faster than the storage used in the IBM machines. They are described as field-upgradable.

The Itel CPUs have smaller dimensions than their IBM counterparts and have "integrated channels." They are said to operate "about nine degrees cooler" than the IBM mainframes.

At least one East Coast user has placed an order for the new CPU to upgrade from a 155 now running with both IBM and independent peripheral subsystems.

He said he has seen the AS/5 machine operating "in its preliminary stages" at an Itel facility. "We are satisfied that the CPU will operate as a 100% plug-compatible system to our 155," the user added.

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Vote Counters Find 'Too Many DPers Spoil the DP'

By Ann Dooley
Of the CW Staff

PHOENIX – Vote counters in Maricopa County have discovered that "too many cooks spoil the broth" – or, rather, that too many DPers spoil the computer operations.

Results of the Sept. 7 election were delayed by two hours when two ballot multiplexer minicomputers (BMX) overheated because there were too many people in the room. "There were too many bodies and not enough air conditioning," according to Mike Griffin, county DP director.

One mini would begin to slow down and then the other would follow, he said.

Finally, someone suggested the disturbed operations might be the result of static electricity created by the people walking around the room and scraping their feet on the carpet, he added.

Heavy rubber mats were placed in the conference room where the counting was being done and one of the minis was taken to the main DP room.

The processing of ballots continued, but it was very slow, Griffin noted.

Overheating Probability

The probability of overheating is attributed to the kind of minicomputer being used, according to a spokesman for Computer Election Systems (CES), vendor of the BMX.

The more card readers attached to the machine, the more heat it generates, thus increasing the likelihood of such a failure, he explained.

This was the first trial of the election system software written by Maricopa County to replace the package used in previous years [CW, June 7].

"Everything worked out fine except for the heat problem and we feel we have solved that," Griffin said.

Steps have been taken to ensure such problems will not occur in the upcoming November election, he noted. Both minis will be placed in the main DP room where static problems will be eliminated and cooling will be provided by heavy-duty air conditioning.

Testing has also been done with positive results, according to Griffin: "There were eight or nine people working and a few observers were in the room for the last election, so we put that number of people in our test plus 10% more and told them to mill around in front of the computers."

Calcomp Trial Gets 'Gag Order'

(Continued from Page 1)

While that is a fairly standard clause in cases of this type, legal observers last week indicated the use of the phrase "nonpublic" rather than "proprietary" or "trade secret" was a new wrinkle.

The second sentence of the order provides that "each producing party shall designate those materials which it claims are nonpublic" unless challenged by another party to the case.

In most cases, legal sources said, it is the obligation of a litigant who wants to keep something out of the public record to prove the material is in fact proprietary or of a trade secret nature.

In this case, however, any party can just claim it wants to keep a document out of public view; it is then the responsibility of another party to prove it should be public.

This is unlikely because few of the litigants in the cases have the resources to devote to such legal issues, sources said. Since all of the "nonpublic" material will be seen by the judge and jury, most of the litigants will not worry whether it is seen by the public, they added.

Privileged Documents

Under Rule 34 of the Federal Rules of Procedure, parties in such litigation must produce all documents that may be relevant to the case unless those documents are privileged.

Under the rule, the parties who want to keep a document out of the public record – rather than another party in the case – are required to prove those documents are privileged.

With this ruling, the judge seems to have the procedure "backward," according to one lawyer, because a firm can just designate any document as nonpublic and it is up to another party in the case to prove it is in fact public.

In the past, IBM has tried to keep a great deal of material in the current antitrust cases against it from public view. It has twice fought the issue over certain documents in the U.S. vs. IBM case all the way to the Supreme Court, only to be rebuffed and forced to turn over the documents anyway.

In the Telex suit against the firm, IBM fought a protracted legal battle to keep its internal memoranda and other documents out of the public record with the same outcome.

In the new cases, the use of the phrase "nonpublic" appears to set a precedent since only information about a trade secret or proprietary customer lists were kept from the public view in the past, legal observers said.

The "nonpublic" phrase, however, is very hard to define since there is no precedent for its use. Effectively, the order means any of the firms can keep anything they want from public view, the sources said.

Catamore Intending To Appeal IBM Case

BOSTON, Mass. – Catamore Enterprises, Inc. intends to file a petition for a rehearing with the U.S. Court of Appeals here, according to its attorney, Thomas K. Christo.

Recently the appeals court vacated a jury judgment ordering IBM to pay Catamore $11.4 million in damages and remanded a new trial [CW, Oct. 4].

The appeals court based its finding on questions of contract liability. It observed Catamore failed to file suit within one year of signing its Systems Engineering Services agreement as specified in the contract's limit of liability.

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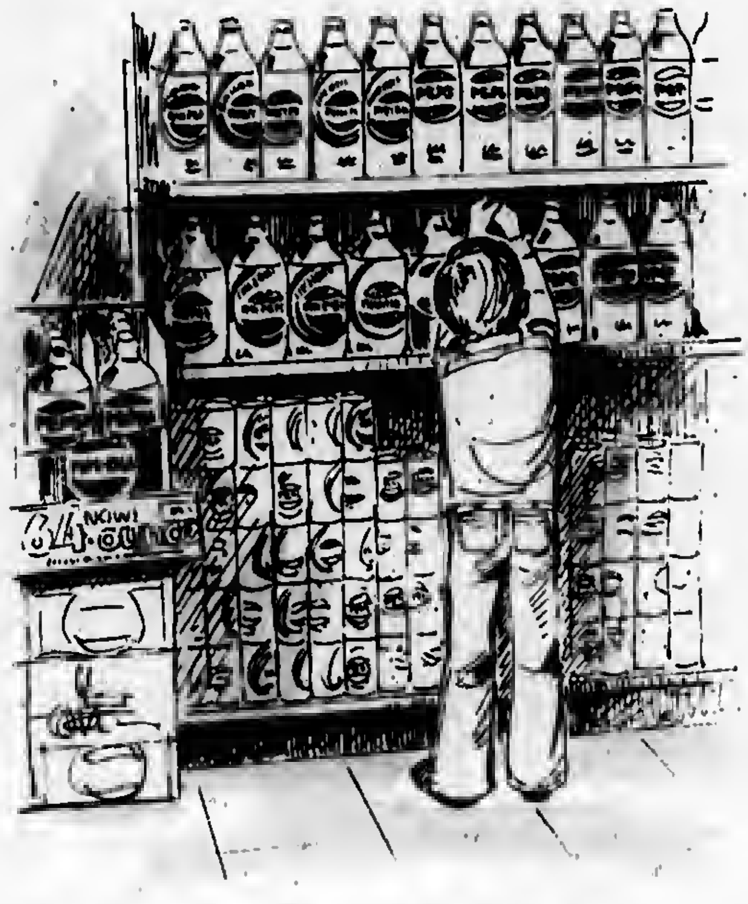

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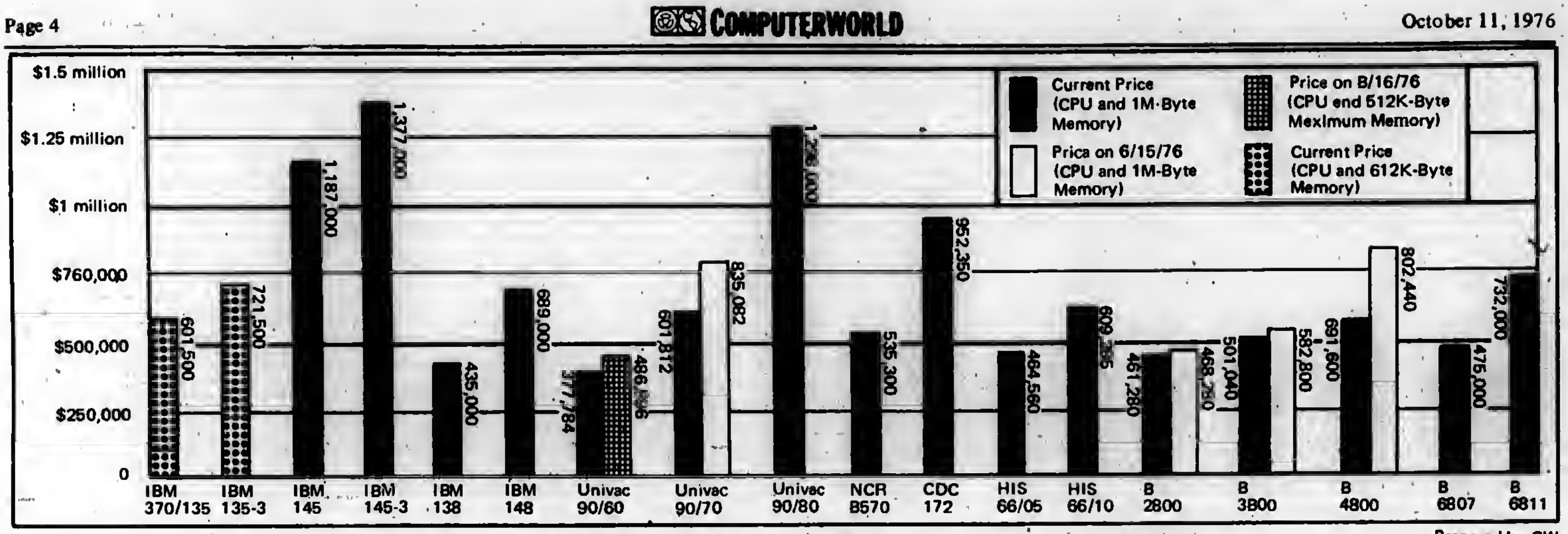

Chart shows diminishing differences in purchase prices based on CPU and 1M byte of main memory.

Prepared by CW

Manufacturer	IBM						Univac			NCR	CDC	HIS		Burroughs				
Model	135	135-III	145	145-III	138	148	90/60	90/70	90/80	8570	172	66/05	66/10	B2800	B3800	B4800	B6807	B6811
Min-Max Memory (Bytas)	512K	512K	160K-2M	983,000	500K-1M	1M-2M	512K-2M	131K-2M	512K-4M	256K-1M	32,768-131,072	384K-2M	384K-4M	100K-1M	100K-1M	200K-1M	393K-3.146M	393K-3.146M
CPU and 1M Byte Purchase ($)	601,500**	721,500**	1,187,800	1,377,800	435,000	689,000	377,784	601,812	1,298,400	535,300	(60-bit words) 952,360	464,560	609,285	461,280	501,040	691,600	476,000	732,000
CPU + 1M Byte ($) (Term Laase in Years)	11,430** (4)	14,615** (4)	22,335 (4)	27,430 (4)	11,415 (4)	17,280 (4)	10,414 (5)	16,602 (5)	26,568 (6)	11,610 (5)	17,756 (3)	10,331 (6)	12,699 (5)	10,822 (5)	11,748 (5)	15,388 (5)	12,870 (5)	16,400 (6)
Purchese/ Lease Retio+	53	49	53	49	38	40	36	36	48.9	46.1	53.6	44.9	47.9	42.6	42.6	44.9	36.9	44.6

** For 512K + Based on given term laase reta including maintenance.

Prepared by CW

A look at purchase prices as well as long-term lease rates and the lease/purchase ratios for a CPU and 1M byte of main memory gives an idea of choices available to users.

Mid-Range Machines Competitive in Price, Features

By Molly Upton

Of the CW Staff

Despite widely varying typical configurations, mid-range systems are highly competitive in both price and equipment features available to users, according to figures compiled by *Computerworld* and summarized in the accompanying charts.

Because of across-the-board adjustments, users now have more options open to them within a given price range.

IBM described "bare bones" systems where prices begin. These include a CPU and associated components with 1M byte of memory (except for the 370/135, which has only 512K), 270M bytes of disk on four spindles and a card reader as well as a 1403-N1 printer on the 370/135 and 145 and a 3203-4 on the 370/138 and 148.

On a four-year lease, the monthly rates are $16,330 for a 135, $16,390 for a 138, $28,520 for a 145 and $22,750 for a 148.

Purchase prices are $813,860 for a 135, $639,050 for a 138, $1.5 million for a 145 and $918,440 for a 148. The 145 price jumps compared with the others because of required gear to hook up the printer, an IBM spokesman explained.

To give some idea of the range in performance of Univac systems, the 90/80 is three to four times faster than the 90/60 in completing selected storage-to-storage instructions.

A Univac 90/60 with 524K memory, 500M bytes of disk, five 1,600-bit/in. tape drives, two printers, card reader and punch and up to eight lines of communications sells for $939,500 and rents under a five-year plan for $23,104/mo.

A 90/70 with 786K, 1,500M-byte disk, five tape drives, 6M-byte fixed head disk, two printers, card reader, punch and the same communications capabilities sells for $1.6 million and leases for $40,444 on a five-year plan.

These two systems are intended to bracket the IBM 148, Univac said.

A 90/80, which Univac can propose against either a 148 or 158, depending on the size, with 1.5M-byte memory and the same peripherals, costs $2.5 million or $56,858/mo under a five-year plan.

An NCR 8570 Criterion with 512K, a 600 card/min reader, thermal printer, VS-1 package, 1,200 line/min printer and 800M bytes of disk, including controller, costs $621,550 or rents for $13,856/mo under a five-year plan. The same system with 400M bytes of disk costs $564,750 or $12,775/mo, a spokesman said.

Control Data Corp.'s Cyber 172, which uses 60-bit words, costs nearly $2.5 million for a system loaded with peripherals. The gear includes 131,072 words of

(Continued on Page 6)

PRICE COMPARISON OF COMPETITIVE CONFIGURATIONS
I Dated 6/76, with 370/135 as Standard
II Deted 9/76, with 370/138 as Standard

I Menufacturer	IBM	B	HIS	Univac
System	135	3800	66/10	90/60
Purchese	1.00	0.84	0.89	0.97
Minimum Monthly Meintenance	1.00	1.09	1.11	1.66
Rent - B hrs. (Mon.-Fri.) Maint.	1.00	0.82	0.90	1.00
Rent - 16 hrs. (Mon.-Sat.) Maint.	1.00	0.88	0.97	1.06
Rent - 24 hrs. (Mon.-Sun.) Maint.	1.00	0.94	0.97	1.12
Fiva-Yeer Rent - B hrs. (Mon.-Fri.) Maint.	1.00	0.83	0.95	0.99
Five-Year Rant - 16 hrs. (Mon.-Sat.) Meint.	1.00	0.86	1.02	1.06
Five-Year Rant - 24 hrs. (Mon.-Sun.) Maint.	1.00	0.96	1.02	1.13

II Manufacturer	IBM	B	B	HIS	Univac
System	138	3800	6800	66/05	90/60
Purchase	1.00	1.00	1.00	1.15	1.07
Minimum Monthly Maintenance	1.00	1.01	1.25	1.06	1.38
Rent - B hrs. (Mon.-Fri.) Maint.	1.00	0.92	0.98	1.00	1.05
Rent - 16 hrs. (Mon.-Sat.) Maint.	1.00	0.99	1.06	1.08	1.12
Rent - 24 hrs. (Mon.-Sun.) Maint.	1.00	1.05	1.13	1.08	1.19
Fiva-Year Rent - 8 hrs. (Mon.-Fri.) Maint.	1.00	0.93	1.01	1.05	1.05
Five-Year Rent - 16 hrs. (Mon.-Sat.) Maint.	1.00	1.04	1.00	1.14	1.12
Five-Year Rant - 24 hrs. (Mon.-Sat.) Maint.	1.00	1.04	1.00	1.14	1.20

Prepared by L.F. Rothschild & Co.

The above tables indicate maintenance prices compared with those offered by IBM. They include the recent Honeywell Information Systems and IBM changes.

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Survey Finds Mid-Range Systems Price-Competitive

(Continued from Page 4)

main memory, 14 peripheral processors, three 1,200 line/min printers, two 1,200 card/min readers and controllers, a total of 10 tape drives (7- and 9 track) and two controllers as well as 2,400M bytes of disk in 12 drives with three controllers and channels. The lease price is $52,866/mo on a three-year basis.

The minimum number of peripheral processors on a Cyber 172 is 10, which are included in the basic CPU and memory price.

A Honeywell 66/05 with 1M-byte memory, a 1,050 card/min reader, a 100- to 400 card/min punch, 1,200 line/min printer, four 75 in./sec tape drives and a total of 351M characters of disk, as well as a front-end network processor with eight lines, sells for $853,524. The lease price under a five-year plan is $19,449/mo.

The 66/10 with the same card equipment and printer, four 125 in./sec tape drives, disk storage totaling 705M characters and a front-end network processor with eight lines sells for $1.1 million and leases for $24,778/mo under a five-year plan.

Honeywell Information Systems' (HIS) basic price for a CPU and 1M-byte memory includes an I/O multiplexer for 18 channels, a spokeswoman said.

Consistent with its theory that Burroughs users often do not need as much memory for the same types of jobs as do IBM users, Burroughs listed most of its typical configurations with less memory.

As an example of its B2800, Burroughs described a 3 mHz processor, 200K-byte memory, an eight-channel I/O subsystem, operator console, card reader, a 1,100 line/min printer and 130M bytes of disk. This system costs $386,000 and a five-year lease is $8,700/mo.

A B3800 with a 4 mHz processor, 300K-byte memory, a 16-channel I/O subsystem, an operator console, card reader, 1,100 line/min printer and 130M bytes of disk costs $445,600 and leases under a five-year agreement for $10,140/mo.

A B4800 with an 8 mHz processor, 400K-byte memory, and the same peripherals as the 3800 costs $572,500 and leases for $12,850/mo under the five-year plan. Before its price adjustments, this system was priced at $683,340, a Burroughs spokesman said.

Burroughs described a B6807 with a 6.7 mHz processor, 1.5 μsec access to main memory, 786K-byte memory and 20-channel I/O subsystem.

It also has an operator console with dual displays, card reader, punch, 1,100 line/min printer, three tape drives and 348.8M bytes of disk and sells for $741,200 or leases for $18,180 under the five-year plan.

The B6811 has a 6.7 mHz processor with 450 nsec access to main memory, 1.18M-byte main memory and a 20-channel I/O subsystem. With a 1,500 line/min printer, three tape drives and 523.3M bytes of disk, the system costs $1.1 million or $25,450 on the five-year lease.

Vendors Competing With 370/138, 148

(Continued from Page 1)

Although, as vendors observed, there are several factors in addition to price, price remains as one of the few means of comparison on an across-the-board basis.

On a purchase price-only basis, however, there appear to be numerous alternatives to the IBM machines.

The purchase price, excluding maintenance, of a CPU with 1M byte of memory was selected as the constant for price comparison.

Lease prices include maintenance. The purchase lease ratio was calculated using the purchase price and the best lease price, or long-term plan most often quoted by the manufacturer.

To be sure, price alone is not the only factor.

Burroughs, for instance, emphasized its systems could be even more competitive than the straight comparison on the basis of a CPU and 1M byte of memory because its systems do not normally need as much memory as IBM units.

Honeywell increased the speed of its 66/10 by 62.5% compared with the previously existing 66/10, as well as expediting other systems [CW, Oct. 4].

The pricing of maintenance is another factor. When L.F. Rothschild & Co., an investment banking and brokerage firm, looked at figures in a recent report, it made the following observations: "When overtime maintenance service charges and other service factors are included, the difference between IBM's systems prices and its competitors' before the price changes was not nearly as material as it appeared at first glance."

In fact, after analyzing "all of the realistically important detail items that comprise a computer configuration and maintenance coverage," not only is IBM the low-price competitor with its 370/138 and 148, but it was "almost equally price competitive before" these machines were announced, Rothschild said.

The Rothschild report observed the competitors' pricing mechanisms seem to be "more simply a function of keeping price within a prescribed range relative to a directly comparable (i.e., in terms of memory, speed and size) IBM product rather than to any sophisticated performance evaluation scheme.

"We also find that IBM's competitors cleverly utilize maintenance pricing schedules to favorably alter rental and lease pricing comparisons," Rothschild said.

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CW01

Lawyers Exonerate DP in Prisoner's Tax Fraud Acts

By Molly Upton
Of the CW Staff

LEAVENWORTH, Kan. – An inmate at the federal penitentiary here was convicted of conspiracy for filing false U.S. income tax claims and cashing $19,000 in refund checks, but no evidence was presented linking his actions to use of either the penitentiary's stand-alone computer or its link to the Infonet network, according to both attorneys at the trial.

Despite extensive press coverage alleging a connection between the penitentiary DP training program's stand-alone NCR computer, an Infonet link and James Ready's false tax returns, no such affiliation was established, according to Assistant U.S. Attorney James Pusateri.

Word of the connection was carried initially in the *Wichita Eagle and Beacon* newspaper, and subsequently picked up by other papers and at least one national magazine.

In the opening statement of Ready's trial, his attorney, Thomas Dawson, indicated other prisoners had used the prison's computer facilities to figure out percentages of returns to file. However, Dawson said, testimony to this effect did not develop.

Both Dawson and Pusateri agreed that Ready's actions were those which could have been done with pen and pencil.

Ready's wife, who was not in prison at the time, was also convicted of conspiracy and conversion of two refund checks, Pusateri said.

Evidence of Returns

Pusateri said he had evidence Ready and his wife had been busy since 1973 filing false tax claims for a total of about $80,000 in refunds. However, Pusateri said he filed charges only for those checks which Ready received while in his jurisdiction.

Although Ready's filings appear somewhat prolific, Pusateri said it seemed to him to be a process someone could do without a computer.

Rehabilitation Program

Where does the computer angle come in?

As part of an inmate rehabilitation program, the prison has a stand-alone NCR Century 200 system on which it trains prisoners.

The prisoners set up a corporation, Federal Prison Industries, which has obtained contracts for program development from the Department of Agriculture.

In addition, a Leasco, Inc. terminal was installed in November with a line to Infonet, the Computer Sciences Corp. (CSC) network used by several federal agencies including the Department of Agriculture.

But the IRS is also among those agencies using Infonet.

This left observers to speculate on the possibility inmates were somehow accessing IRS data on which returns were being audited, on complex calculations acceptable in returns or any number of other pieces of data thought to be maintained by the IRS.

Press reports brought prison officials, inmates and CSC rallying to defend the reputation of the Infonet link in the prison.

Warden Charles Benson said there has been no indication of any connection between the Ready case and the prison's computer and terminal.

Inmate Walter E. Murgg sat down at a typewriter and wrote a one and one-half page letter refuting charges printed about Ready's crime and implications that the computer training program was involved and sent it to news publications.

"Any fraud that may or may not have been perpetrated against IRS does not and did not include any participation by the computer at this institution," Murgg said.

"This program has proven to be the most viable in the entire prison system in terms of rehabilitation. The graduates can return to society with a marketable job skill and experience and the recidivism rate is very low compared to the national average.

"We are proud of this program," he stated.

Security Precautions

An Infonet spokesman cited the precautions taken at the prison in addition to those security precautions inherent in the Infonet system.

The terminal is kept in a locked room when not in use; either the DP manager or his assistant is at the terminal whenever it is in use, according to the spokesman.

The prison operator only gives outside lines to those whose voices she recognizes, and printed copies of all work performed on terminals are reviewed daily.

Also, the Infonet link was not established until long after Ready had been filing false tax claims, he pointed out.

Finally, Ready was not part of the DP program and had no access to its facilities.

"CSC says flatly nobody broke into our system and it's impossible for a Leavenworth convict to have misused our system," he continued.

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Computerworld

But T/S System 'Too Little, Too Soon'

IBM Rushed 67 to Mart to Maintain Status: Justice

By Catherine Arnst
Of the CW Staff

NEW YORK – The 360/67, IBM's entry into the time-sharing market, was introduced as a "fighting machine" to combat the gains made by General Electric with prestigious scientific time-sharing users, but it was "too little, too soon," according to documents filed as evidence by the Justice Department in the U.S. vs. IBM antitrust trial here.

The 360/67 was rushed onto the market, without proper programming support and with promised delivery schedules that would later prove impossible to meet, in order to maintain IBM's position as a market leader, the government is contending.

The documents, mainly internal IBM memoranda, indicated the most prestigious scientific computer users were considering "remote scientific computing" – time-sharing – systems from IBM's competitors, primarily General Electric, in the summer of 1964. One of these users was MIT's Project MAC.

IBM, however, did not have a time-sharing computer in its newly announced 360 line and did not want to sit back and watch "gold chip" customers going to competitors.

A time-sharing task force was formed that had as its members 24 people knowledgeable in remote computing from all departments in the corporation. Among those mentioned in IBM memos introduced by the government were Frank T. Cary, T. Vincent Learson and Gene Amdahl. Amdahl was a designer of the 360 system.

By the fall of 1964, IBM had decided to develop a machine that would draw substantially from the 360 line, but would include time-sharing features. This machine was originally intended as a special solution for Lincoln Laboratories, but a determination was made that the machine would be offered as IBM's time-sharing product, the memos indicated.

In the spring of 1965, IBM still planned to keep the machine on a limited or special bidding basis. Programming problems were being encountered and funds were lacking for this project.

One member of top management indicated the product was being designed according to requirements coming from outside of IBM and therefore lacked the corporation's normal control over its products, according to one memo.

A speech given March 4, 1965 to Share, the IBM user group, made the time-sharing machine an even more public – though still unannounced – IBM offering. The machine remained in this quasi-announced state until August.

Concern About Promises

Promises made, particularly in regard to delivery dates, were a cause of concern among top management in the months both preceeding and following the Model 67 announcement, the documents indicated.

Deliveries were scheduled to begin in July 1966, but memos written only a few months earlier showed the 67's programming division was understaffed and management was anticipating no less than four months' slippage in delivery dates.

Although there was some optimism within the company concerning the Time Sharing System (TSS) software being developed for the 67, rumblings of dissatisfaction were coming from other quarters within IBM.

"DP is requesting from the Products Division such complex systems that [it gets] all bogged down. Selling becomes easier for DP when [it] can promise the moon," a memo said, pointing out that the firm should instead offer " 'poor man's' time-sharing system as our competitors are, and slug it out with them in the marketplace."

Complaints were coming from customers, too, the documents showed. David Nickerson, director of Carnegie Tech's Computation Center, for example, complained design was poor and delivery late.

"Now you send us this memorandum which withdraws all warranties on what you are doing. How am I to interpret such a letter? You don't know if it will work, you don't know what its performance will be and you don't guarantee compatibility. What do you guarantee?"

IBM began to sense a "groundswell" against the system from the prominant users to whom it had already committed the 67, and managers estimated at least 50% of its accounts were looking at the competition.

Controlled Marketing Strategy

IBM decided to follow a strategy of controlled marketing for

(Continued on Page 15)

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But T/S System '1

IBM Rushed

By Catherine Arnst
Of the CW Staff

NEW YORK – The 360/67, IBM's entry into the time-sharing market, was introduced as a "fighting machine" to combat the gains made by General Electric with prestigious scientific time-sharing users, but it was "too little, too soon," according to documents filed as evidence by the Justice Department in the U.S. vs. IBM antitrust trial here.

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Credit Cards Used in EFT Service

Customers of Ten Banks Now Paying Bills by Phone

By Toni Wiseman

Of the CW Staff

SEATTLE – People in Minneapolis, Pittsburgh, Des Moines and Seattle are writing fewer checks as a result of an electronic funds transfer (EFT) system which allows consumers to pay their monthly bills when they want, in the amount they want, by telephone.

Pay-by-Phone, a turnkey system supplied by Telephone Computing Service, Inc. (TCS), allows customers of participating banks to make credit-card payments from special interest-bearing accounts.

The package is configured in different sizes depending on the institution and its environment, according to TCS' director of marketing, William E. Koenig.

Ten banks are currently using the package; two more will begin operations next month, and an additional 40 are under contract, he said. This represents more than 13,000 merchants' credit cards in seven states including New York, Connecticut, Massachusetts, Minnesota, Pennsylvania, Iowa and Washington.

Typical System

The typical Pay-by-Phone system uses the home push-button telephone to initiate an EFT through a minicomputer equipped with voice response. The unit asks the customer for his account number, secret code, the name of the firm he wishes to pay and the amount.

Each of these items is verified by voice response with the customer, who can then make any changes or continue to make additional payments. Customers can obtain a subtotal of payments at any time, as well as their current bank balance.

Pay-by-Phone customers can also use rotary dial telephones and direct a teller to enter the transaction data into the computer through an on-line terminal, Koenig noted.

Security Guaranteed

Even with a human operator, the security of the system is guaranteed, Koenig said; every transaction is tagged with the operator's identification number so there is a clear audit trail of both who called and who handled the transaction.

"Even if tellers were to access a customer's account by knowing the account numbers and secret codes, all they could do would be to transfer money to one of the merchants' accounts," he added. "They couldn't extract any money from the system."

Each day, all of the transactions from the previous 24 hours are processed and checked for correct merchant codes, account holds and sufficient funds. Customer accounts are debited for the amount of all transactions; all of the payments to an individual merchant are totaled and a single check is printed.

Alternatively, the merchant can have the amount deposited in an account and receive a deposit slip.

A report is printed for the merchant listing the name, address, account number and payment amount for each customer who directed payment.

The banks which have installed the system to date have used a mainframe computer to do the batch processing and to interface with the CRTs, Koenig said. TCS has installed a mini for the voice response part of the system.

In the future, a mini will handle both collection by CRT and voice response as well as perform all batch processing and interface with the bank's mainframe.

The voice response unit is from Wavetek, he said, while the CRTs, disk system, printer and mini (ranging from a Datasystem 310 to a PDP-11/34) are from Digital Equipment Corp.

While customers are charged 10 cents per transaction, they save on postage and the EFT system is much more convenient than writing checks, Koenig said. "And, typically, they are able to earn interest on the money up until the time of payment," he added.

Small Bank System

For smaller financial institutions, the Pay-by-Phone package does not use voice response. Instead, all calls go through a teller who first writes everything down on paper and then debits the account via an existing terminal or whatever other device the bank uses.

At that point, the data enters a very small minicomputer which generates the same reports as the larger systems, he said.

In large configurations, the bank has the option of voice response and a second option of having the data formatted onto tape before the customer's account is debited on the mainframe. The various configurations handle 4,000 to 200,000 customers, Koenig said.

FEA Analyzing Home Energy Use In Mass., N.M. Pilot Studies

WASHINGTON, D.C. – The Federal Energy Administration (FEA) is offering homeowners in Massachusetts and New Mexico a computerized analysis of their home energy use and specific recommendations of ways to save energy.

Under "Project Conserve," the homeowner completes a questionnaire comprised of 29 questions and in return receives a free analysis of his home's energy use, heating bills, cooling bills and thermal characteristics. Suggestions for improvement are based on local utility and construction costs, according to the FEA.

State characteristics such as extremes of temperature and a large number of single-family homes were important factors in the selection of Massachusetts and New Mexico for the pilot study.

The questionnaires are coded and data is then keypunched by a service bureau. The information, along with cost data collected by Zip Code, is processed on the FEA's IBM 370/168 and a printout is returned to the homeowner.

To date, 107,500 Massachusetts homeowners have participated in the program. FEA officials expect homeowners following the recommendations of "Project Conserve" to cut their total energy consumption by 15% to 30%.

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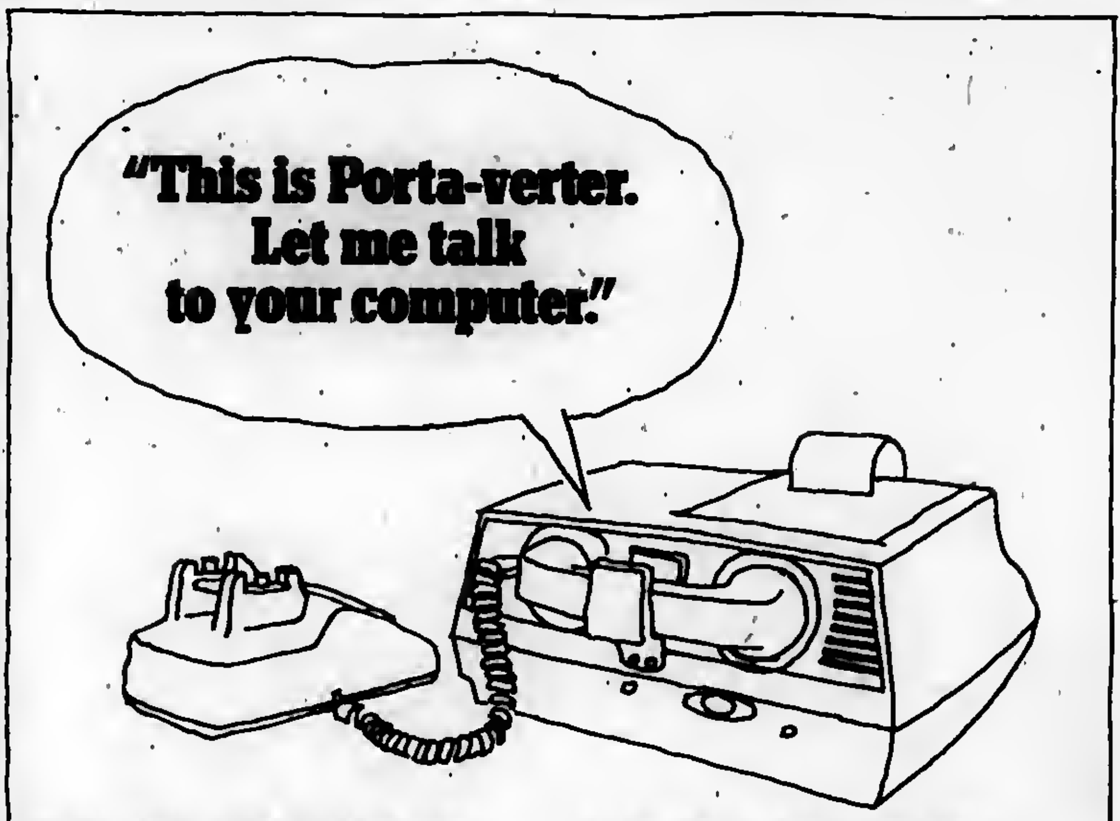
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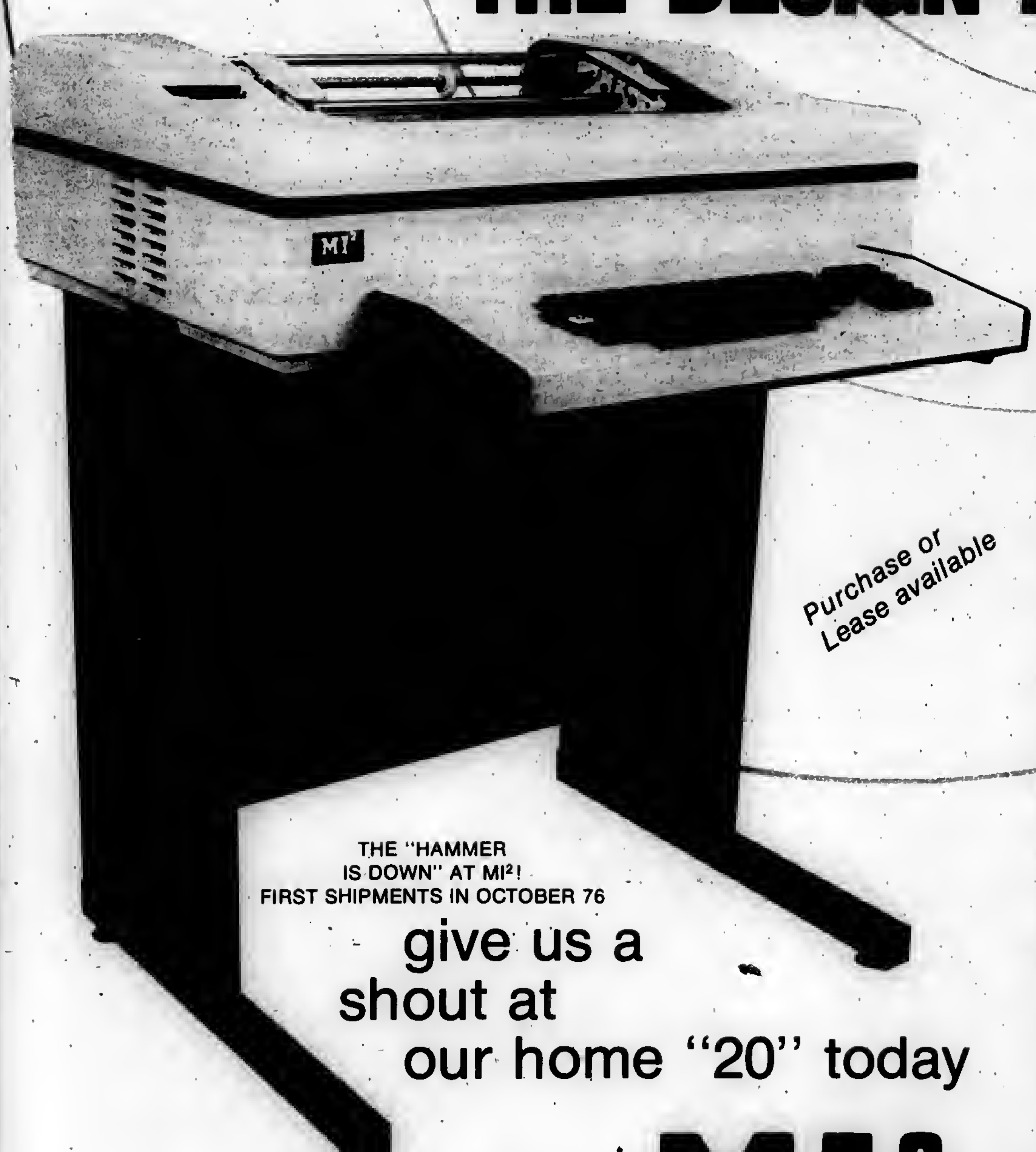

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Federal Reserve Rules Credit Reporters Must Set Up Separate Files for Spouse

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. – Credit-reporting agencies must be able to separately report the credit histories of husbands and wives when they share data after June 1, 1977, the Federal Reserve System's Board of Governors has decided.

From that date on, the agencies will be required to set up separate files under wives' names; duplicate files of past credit information will not be required.

Since the reporting requirements of Section 202.6 of the regulation implementing the Equal Credit Opportunity Act have been uncertain for the last several months, the board also extended the deadline for compliance from next Nov. 1 to the 1977 date.

This should give DP departments time to revise their files and recordkeeping systems, a Federal Reserve spokeswoman explained.

The board had previously considered an amendment to Section 202.6 which would have permitted creditors to report credit information about a married couple only once "in a manner reflecting the participation of both spouses."

In offering the amendment, the board was concerned the separate files proposed for married women under the regulation as it now stands might be incomplete, she said. The board also feared it would be both costly and technologically difficult for credit reporters to access one file under two names, she added.

The board proposed this amendment late last spring and invited comment from the industry. Responses from the credit industry and the board's own study convinced the Federal Reserve the technological problems envisioned did not exist, according to Nathaniel E. Butler, an attorney with the Federal Reserve Board.

However, the costs of revising all the records of shared accounts to conform with the amendment were found to be prohibitive, Butler stated.

Women's Rights Not Issue

At no time were the rights of women to establish credit records at issue, the board claimed.

Section 202.6 was specifically designed to remove the obstacles many women – particularly those who are divorced or widowed – have encountered in attempting to obtain credit; it was intended to enable married women to develop a credit history, the spokeswoman said.

Traditionally, creditors reported information relating to the accounts of married couples in the husband's name only. Only the husband accumulated a credit history, she explained.

Apart from shared accounts, a woman who is creditworthy in her own right will be able to establish her own separate file accessible through the use of her name alone by opening individual accounts, the spokeswoman noted.

This same provision was provided for in the now-defeated amendment, she added.

Kit Maker Says 'Do-It-Yourself' DP Not Exclusively for Hobbyist

BERKELEY, Calif. – The age of the "do-it-yourself" computer for general business and home use is already here, a pioneer in the computer kit industry said recently.

"The nonprofessional computer user doesn't have to wait until 1980 or beyond to have his very own computer. That time is here and now," according to Pete Roberts, president of Computer Kits, Inc. here.

Roberts was responding to comments made at the recent Urban and Regional Information Association (Urisa '76) conference in Atlanta about the need for less complicated computers and systems.

Computer kits are not the exclusive province of hobbyists, Roberts said. "There are plenty of business and home systems already available in kit form, and additional software is being developed for the small computers currently on the market," he pointed out.

Suggesting larger computers and their manufacturers are working on "an older idea," Roberts said "it's unrealistic to expect them to have changed [to the smaller computer idea] any sooner."

The trend toward the small computer is here, however, and manufacturers are beginning to produce small business computers to replace the larger computers which require several people to operate them, he added.

"Every business already has a use for a computer," Roberts said, adding the cost of systems for non-DPers makes it practical for every business, and even every home, to have a functional computer today.

A system built from a kit gives the owner a capital asset that requires only a one-time cost ranging from $2,000 to $8,000. It eliminates the costs required for phone calls to plug into a time-sharing system and there is no usage cost, he explained.

The cost of such a system is probably less than a year's rental on a time-sharing system, and the individual has the advantages of ownership, Roberts said.

The technology already exists in top-quality kits for almost every conceivable business application and some kit vendors are available for programming and analysis consultation, he said.

Firms using computers built from kits include real estate agents, options brokers, schools and small businesses, he noted.

Handbook Discusses LEAA Privacy Rules

SAN JOSE, Calif. – Theorem Corp. has published a handbook on how to interpret and implement the Law Enforcement Assistance Administration's (LEAA) privacy and security regulations.

Divided into five chapters, the handbook addresses rules for disseminating records, discusses information quality and includes information on purging and sealing techniques. It also contains a section on security methods.

The manual costs $4.90 from Theorem at Suite 590, 1737 N. First Street, San Jose, Calif. 95112.

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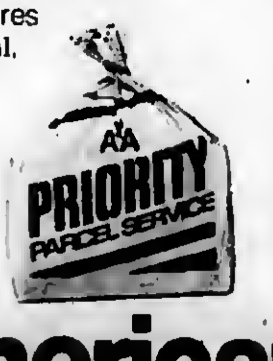

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Add-On to Inventory System

Pharmacies Print Bilingual Drug Labels

By Nancy French
Of the CW Staff

LOS ANGELES – Labels printed by computer in both Spanish and English are helping the Los Angeles University of Southern California (USC) Medical Center here ensure that Spanish-speaking patients can understand the directions on prescription bottles.

Almost half of the one million prescriptions filled annually at the county's five pharmacies go to patients who speak Spanish primarily or, in many cases, exclusively, according to Robert Best, county DP director.

Information printed on each label is standard for each drug. It informs the patient how often to take the drug and warns against misuse.

When a patient presents a prescription at a county pharmacy, a clerk enters it into an IBM 370/158 computer via an IBM 3277 CRT terminal while the pharmacist starts filling it.

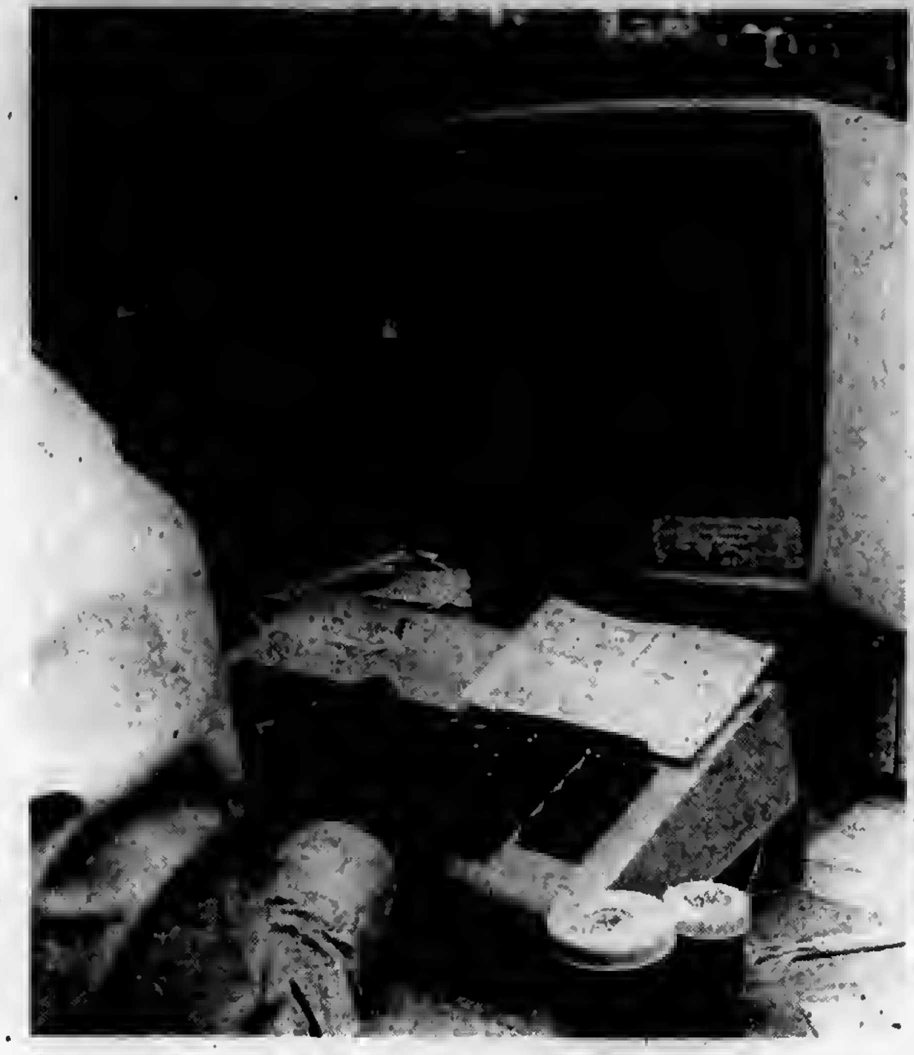
The computer activates an IBM 3284 printer in the appropriate pharmacy; the printer produces the label in either English alone or English and Spanish, according to Best.

At the same time the system prints a label, it checks the patient's file number, placed on each prescription by the doctor, to assure the prescribed drug will not react adversely with other drugs the patient may be taking.

"There are about 30 drugs which interact negatively with each other," Dr. Robert Maronde explained. Maronde heads the clinical pharmacology department at USC's School of Medicine.

If the new prescription could cause a problem for the patient, the pharmacist can contact the doctor for additional instructions, he added.

As each prescription is filled, the system updates the inventory. When inventories reach preset levels, varying with different types of drugs, the computer automatically prints an order for more supplics from the county's central pharmacy.



A clerk at the Los Angeles County Medical Center enters prescription information into the county's mainframe via terminal. The computer then can order a label for the prescription printed in both English and Spanish.

The computer is programmed to analyze each order point so if doctors stop prescribing certain drugs, the system will lower the reorder levels for them, Best noted.

The bilingual printing capability was a very inexpensive add-on to an already existing inventory control system, according to Bob Zurbrigen, chief of health care systems for the Los Angeles County DP Department.

"All we had to do was add another table that translated the English instructions into Spanish" at a cost of less than $500, Zurbrigen said.

IBM Rushed 360/67 to T/S Market To Head Off Competitors: Justice

(Continued from Page 11)

the 67, with all proposals requiring the approval of regional management prior to submission to a customer, the documents showed. It decided no additional functions for Release 2 of the TSS would be announced although they had been promised to customers and all follow-on functions of Release 1 would be withdrawn.

This announcement resulted in a reaction of "bitter disappointment" from Share members, the documents said.

By the spring of 1967, IBM management was predicting poor performance for the Model 67 and found "inefficiency" was the system's most serious problem. Internal memoranda indicated top management decided the March 1965 proposal for time-sharing and graphics was overly optimistic and concluded the TSS/67 would probably never be more than marginally productive.

The system was not at all productive as far as profits were concerned – the total 360/67 system showed a loss of $59.8 million while the CPU alone showed a loss of $86 million.

IBM's customer level for the 67 had reached the bottom of a bell curve; there were 107 acceptances predicted at the announcement of the system in 1965 and 170 in 1966, but that number dropped to 76 when the major decommitment of functions was made in 1967.

Still, IBM continued its commitment to the time-sharing program for fear it would lose prestige and eventually customers to its competitors, the government is contending on the basis of the documents.

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Editorial

Spreading the Wealth

The U.S. government has a seemingly endless number of federal grant programs available to state and local agencies to provide financial assistance in specific areas.

These grant programs, their available funds and the necessary prerequisites required to qualify for assistance would seem to lend themselves to a computerized data base.

Such a central file would quickly and efficiently allow potential applicants to get all the necessary information. And a data base on federal grants would help to channel these funds to the people that best qualify and, perhaps, can demonstrate the most need.

But a computerized index of federal grant information has been stalled in Washington, D.C., and even in some individual states, for a long time. Clearly, this is not a technological problem and the cost is not prohibitive.

The roadblock is apparently political in nature. Federal grant programs are designed to distribute funds to help those who otherwise would not get help. At the same time, these funds appear to be a convenient framework for helping political friends.

There are successful administrators at all levels of state and local governments who pride themselves on their ability to procure grant money. These people appear to have inside information on "free money."

The hesitancy to centralize current grant information is undoubtedly tied to the federal purse strings which are normally available only to the select few.

The myriad of federal grant programs has literally something for everyone. It ranges through an enormous list of disciplines including such areas as wastewater treatment, law enforcement and regional planning.

These grant programs are designed to help anyone who can qualify. Information on these programs should not be coveted and carefully parceled out by agencies and politicians to selected beneficiaries.

A computerized data base of grant information is long overdue. It might eliminate some close political ties, but it certainly would go a long way toward making federal grant programs operate efficiently and objectively.

A data base available for access by all applicants might even allow some of these programs to be administered in a manner that would meet the lofty ideals expressed in the legislation that created them.

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Computerworld

'Let's See How Much the Republicans Are Spending on This Month's Playboy.*'*

Letters to the Editor

CDP Rating Doesn't Rate For Preferential Treatment

James M. Brown's complaint that "CDP" was not printed after his name [CW, Sept. 27] seemed a little bit ridiculous. Would he also like to have "Member of Board of Directors of ICCP," as he proudly noted, written after his name or his "BA" and "MA" or any other initials for which he happens to qualify?

Surely on your ego trip, Brown, you do not believe your "Letter to the Editor" should get more attention or your opinion should be more highly received because of your CDP rating.

The "Letters to the Editor" column serves the purpose of eliciting a response from a general audience. Though it may be hard for you to believe, some letters may come from persons with even higher qualifications than your own and these qualifications may not be listed to support their professionalism.

Finally, it is not for you to say that a person shining shoes fails to take pride in his work because he lacks certification.

I'll simply sign my name.

Robert J. McGriff

Chicago, Ill.

Another Way to Get a Safe Seat

According to Alan Taylor, ". . . the rate of increase of secondary no-shows is currently increasing faster than genuine no-shows" [CW, Sept. 27]. It is no wonder.

While discussing methods A and B is necessary for an understanding of the problem, the box and caption can only be interpreted as an attempt by Taylor to aggravate the problem. Why doesn't he mention Method C which will substitute for Method A every time?

Simply make reservations on the second flight and stand by on the earlier flight. Then if you are not seated on the earlier flight, you can check in early enough on the second flight to avoid being bumped.

Cost: passenger time, but zero additional no-shows.

John S. Wylie

Philadelphia, Pa.

Benson's Defense Supports His Pet

My defense of a language is based on a sound and comprehensive analysis of the advantages of the language and its applications. Miles Benson's defense of a language [CW, Sept. 27] is just to support his "pet" (i.e., a language for which he feels affection, but which doesn't produce anything of value).

The original Benson article [Aug. 23] maligning "Snobol 68" was a mistake no matter which way you look at it. It was either an incorrect assessment of the Snobol language and its descendents or it was an extremely inept use of a pseudonym very close to the name of an existing language.

Are the readers of *Computerworld* to assume that when names of languages (or computers, etc.) are given in the articles that we are only being invited to play a guessing game as to what the article really is about? And then, when a reader writes in to find out if the "IBM 1108" discussed is really made by Univac, the response would be, "No, guess again."

We, the readers, are entitled to a retraction and correction for both the original article and the follow-up.

Henry E. Schaffer

Raleigh, N.C.

(Other letters on Page 18.)

Data Past

Five Years Ago
Oct. 13, 1971

WHITE PLAINS, N.Y. – Two major equipment problems were removed when IBM extended magnetic tape capabilities to the 3/10 and added the 96-column card to smaller models of the 360 and 370 series.

The 3410 system provided a tape capability to the 3/10 and added a slow tape system to the 360 and 370 series. The system mounted standard tape reels horizontally, instead of vertically, and eliminated the need for a separate controller by incorporating control circuitry into the 3411 drive unit.

– – –

NEW YORK – Robert V. Jacobsen, president of Bradford Security Systems, contended that a computer user's ability to recover from a fire depended on the building and not the hardware, thereby necessitating extensive fire protection programs. Jacobsen prescribed a five-step protection plan for a computer facility including prevention, detection, personnel evacuation, fire fighting and loss control.

Eight Years Ago
Oct. 9, 1968

WASHINGTON, D.C. – An investigative report for the U.S. Air Force by Logican, Inc. showed that while PL/1 programs took less time to code, they took longer to check out because of programming errors. Compared to Cobol and Fortran, PL/1 was found to be prone to error, unsuitable for use by the nonprofessional programmer and harder to learn.

A Pungent Panel

There was a very pleasant but lightly attended regional meeting in Denver last month, at the Cosmopolitan Hotel. I was in town for an ACM chapter chairmen's meeting, and was asked to join as *agent provocateur* with a panel of four very serious guys concerned about EFT, Electronic Funds Transfer. Two were locals, as was the moderator; one of the two spoke for the retail merchant viewpoint, but with every appearance of concern for consumer values also. The other was from the largest bank; Colorado does not permit branch banking, so sizes are small and competitors numerous. Then there was the head of the ACM ombudsman function, and a bank examiner from the Payment Systems Branch of the Comptroller of the Currency, back East. No black hats, but plenty of disagreement.

What we all appreciated was the vigorous audience participation. There was at least one young man to the left of *me*, which is unusual in a computer meeting, and then a continuum all the way to an Ayn Rander. Naturally, there had to be some fairly heavy language, and some struggling for the floor, but really it all went amazingly well.

The basic argument revolved around economics. Not economics versus personal freedoms; indeed, we started out that way, but before we had more than touched on the encryption algorithm, and whether to trust IBM more or less than NSA, most of us swung around to basic money.

One thesis was that the interest that could be earned on the "float," if it was de-floated, was what the bankers wanted. But then the fact that the float works both ways came up. I started by championing the idea that the disposable resources of society were slow to expand, and in fact might now be contracting; that technical tricks like EFTS, or computers broadly, or the whole credit phantasmagoria, are just sneaky ways of real-locating that wealth – take it from the truck farmer, give it to the chip designer!

That didn't fly too nicely either, at least partly because the audience didn't want to feel greedy. Victims, fine; disinterested programmers, hum! But not the beneficiaries of such dubious deployments. We then bounced off to the cost of credit, and with minor excursions to the technical problems of identification at cash dispensers, stayed there the rest of the morning.

Two major points were made. One was that the whole apparatus of credit was hellishly wasteful; that the pile of real goods and pleasures to be whacked up would be much larger if the banks and credit unions and S&L's and credit cards and skip tracers and verification networks and EFT technology didn't exist, and the people milling around therein went out and grew potatoes or wrote science fiction. We all agreed it was too late; that we were stuck with currency, checks and electronic money, and couldn't go back.

Then came the second point: if credit, if goods-in-advance, if car leasing and Ticketron are inevitable, should we not as technicians design, and as consumers demand, smooth unobtrusive elegant credit? Should we not spend resources to make credit available everywhere, instantaneously, and without humiliating interrogations? Should we not expect prices to rise to cover defalcations and bankruptcies and slow payers, and expensive EFT methodology? Or should we tighten up, pay premiums to good risks and cash buyers? In general, the audience was nervous about being trapped, wanted somebody to look hard at the proposals on their behalf, wanted to be persuaded. They did not seem, at least in Denver, to think that it was too late, that the die was cast. Reference was made to the slow acceptance of the grocery code: automated supermarket checkout.

The audience was full of insiders, men and women actually at work with data banks and credit handling. Yet clearly the majority wanted to go slower. Two panelists boasted of diversity – that there could be dozens of EFT systems, that humans could live in the crevices between. I said no, drew a comparison with the need for a single voice-communications net: Ma Bell. But I didn't make anyone happy. Keep it small, go slow, watch for crime and greed – that was the message.

Herb Grosch

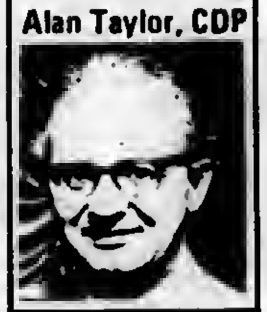
Now's the Time to Get Ready for 1977 CDP Exam

It's that time again when letters start coming in inquiring about the Certificate of Data Processing (CDP) exam – what it is, how to take it, etc. This year is no exception, except the letters seem to be coming in a bit sooner than before.

The Taylor Report

By

Alan Taylor, CDP



In the past, the letters were a somewhat bittersweet experience because while the move from the Data Processing Management Association (DPMA)-controlled old CDP organization to the more widely backed Institute for Certification of Computer Professionals (ICCP) was going forward the examination itself and the key data for the intended recipient were still comprised in a rather obsolete study guide.

This year it is different – the study guide has been updated. The books referenced are much more up-to-date (including new ones like the Association of Systems Management's recent *Business Systems* [Willoughby & Senn] and the Canadian Institute of Chartered Accountants' *Computer Audit Guidelines*, both published in 1975). In respect to date, contents and range, the new listings are very much better than the old one. Good work, someone.

Old Problem Lingers

The other old problem still survives with the guide, but I think I've found the method of answering the CDP sample questions that are published and which have always given me trouble in past issues of the guide (See box). First, however, let's examine the examination itself.

The exam has five sections, lasts for 250 minutes and is open to anyone interested in taking it. (You can't actually get the CDP without 60 months of experience, including time off for academic credit, but you can take the exam and should prepare for it). Each section contains 60 multiple-choice questions and all sections are given on the same day.

The exam will be given on Saturday, Feb. 19, 1977. Alternative arrangements for the exam to be taken on Sunday, Feb. 20, are possible for religious reasons.

The cost of the examination varies from $45 for those taking a single section to $85 for those taking the full examination. The application for the registration form should be completed as soon as possible, but not later than Dec. 15. This should be sent to the ICCP, 304 E. 45th St., New York, N.Y. 10017.

The sections of the exam include:

- *Data Processing Equipment.* A standard "what is the hardware we work with" approach to fundamentals, this section should give few problems to the serious computer professional, although much may come as a surprise to many application programmers or systems analysts who work in restricted environments.
- *Computer Programming and Software.* Cobol is the focus here and structured programming takes its place along with the old favorites of programming basics – looping, macros, dumps, etc. However, non-Cobol understanding of interactive simulation, list processing and other languages is required. As with the section on equipment, narrow specialist knowledge, one of the problems of the industry, just will not be sufficient to satisfy the CDP requirements.
- *Principles of Management.* This section is divided into DP and general management and brings out the essential differences between running a DP shop and jumping into the management of a profit-oriented business.

The contrast between the two certainly sharpens the understanding of these two ways of life and is helpful whether or not the DPer makes the jump. In fact, understanding of the realities and parameters of business is probably a prerequisite for performing a successful systems analysis (which may be why many such analyses look good, but don't work).

- *Quantitative Methods.* This is an uneasy mixture of accounting and mathematics, linear programming, operations research and statistics. Hopefully, someday this will be unpacked into its separate sections. Auditing, for instance, is simply unrelated to time series analysis, even though a good auditor may want to use the technique sometimes. But both subjects are certainly relevant to the certificate. Make the best of it.
- *Systems Analysis and Design.* This is my favorite section, a six-part section dealing with the systems analysis of life cycle and control methods. This brings into focus the uses of the information shown in the prior sections.

If there is one section which indicates DP understanding, this is it. Even the study guide makes a good checklist of activities for any installation. You might like to see if your place really does cover the waterfront or has left something out.

So, there it is. The 1977 CDP examination schedule – the only widely backed DP certification program we have.

Answering CDP Exam Questions

1. In a microprogrammable minicomputer, the microprogram is stored
   1. in core memory.
   2. on magnetic tape.
   3. in read-only memory.
   4. on a direct access unit.

18. In a real-time control system, each logical message requires 500 milliseconds of control processor time. Each remote control device requires synchronized service 5 times per minute. Which is the best estimate of the largest number of remote control devices that can be served?
   1. 10 thru 19
   2. 20 thru 29
   3. 30 thru 39
   4. 40 thru 49

These two questions, taken from the *CDP Guide* and *1977 Announcement*, illustrate a problem with the CDP examination I have had for years. What really are the correct answers?

In question 18, for example, you can't safely get more than 24 terminals polled if they always have messages. So, if they require this frequent polling as a safety measure, the lower range would be right. But the question calls for the "largest number of remote control devices," and 10 to 19 doesn't include the largest number. It has to include 24. So?

Similarly, the placing of microprograms is not confined to read-only memory. Some are – indeed, most are. But, particularly for development work, you want to be able to change the programs and the hardware permits it. So – what is the answer? And how do you find it?

Answer – don't look for the correct one, simply disqualify the others. The one correct answer will then fall out, even if on occasion you know, or think you know, a bit more about the subject than the question permits. The answers are 1 and 2 respectively.

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Letters to The Editor

Passengers Responsible For Overbooking Problem

No, Alan Taylor, the computer is not responsible for overbooking [CW, Sept. 20, 27]; I am and so are many of my colleagues; and you probably are also. Anyone who books one flight and takes another without canceling the first is to blame.

Or perhaps you would like to blame the rather liberal airlines' policy which lets you use your ticket on a flight other than the one on which you reserved a seat.

You would probably like to blame some aspect of our technological society. The culprit, then, should be the operations research technique known as dynamic programming.

Dynamic programming is an attempt to quantify how many a "few extra" should be.

Clearly, it is not an exact science; it is based on probabilities. A flight which averages 10% no-shows might not have any no-shows on a given day.

However, the real problem is the passengers.

If I had to pay a penalty of say 20% of my fare for a no-show on the day of a flight, 15% for canceling within two days of the flight and 10% for canceling within a week of the flight, I would probably be more careful about making reservations. With a suitable penalty scheme, I would cancel reservations.

DP is legitimately blamed for enough problems in today's world. Let's not add to that list with problems which are not truly computer related.

Stephen Robinson

New York, N.Y.

Mailing Solution Offered

In reference to the editorial entitled "Nobody by That Name Here" [CW, Sept. 20], we wish to offer a positive solution to the problem of nonpersonal computer letter solicitations.

We are the developers of a software program called Name Isolation Routine (NIR), which edits and removes nonpersonal problem records such as "Mr. Accountant", "Mr. Attorney" or "Mr. Estate" from name and address files.

The major portion of our business is in the area of editing name, address, and Zip Code files for major mailers across the U.S.

James E. Pehta
Vice-President

List Processing Co.
Addison, Ill.

Ten Terrifying Questions
to ask a person trying to sell you
a computerized personnel/payroll system

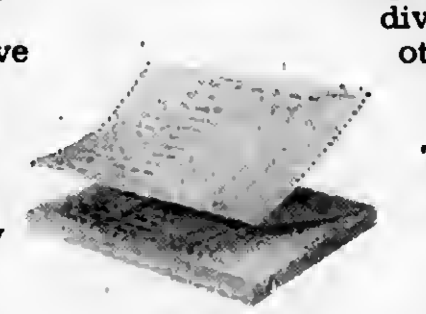
Terrifying question number one
OK, so we're sold on using a system—who's going to install it? Are you equipped to do it? Can you get it up and running fast? Are experts on hand, who have done it before? Will you give us tender, loving care while you install our new system? Will we get good support after we're up-and-running?

Terrifying question number two
Will the system's value exceed its cost? Can you prove it? Exactly where will savings come from? How will costs be cut? Can you give us figures showing savings in time, money, and better use of our staff?

Terrifying question number three
What's your track record? How many systems are actually in operation? Do your users boast about the system? Are they happy? Will they pass on the good news? Is there any good news?

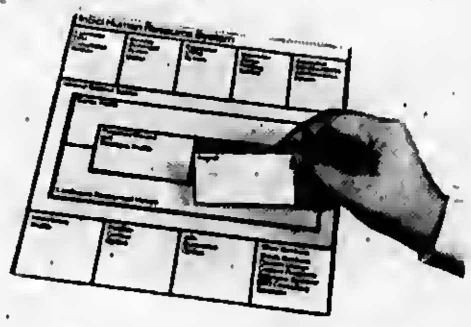
Terrifying question number four
How about documentation? Will we know exactly what we've got? Is it easy to understand? Can we take the reins quickly? We need high quality training and manuals. Will you provide these?

Terrifying question number five
How about reports for EEO, ERISA, and OSHA? Can we handle those? I mean really handle them. Can we meet compliance demands quickly and inexpensively? We'd like to relax on that score.



Terrifying question number six
Will it be a hassle every time we need information? Can our Personnel or Payroll Departments retrieve information without calling in a programmer? Can your retrieval system understand English?

Terrifying question number seven
How flexible is the system? Can we expand it as we grow? Will your people sit down and discuss our particular needs and tailor the system to them? How comprehensive is your Payroll system? What about manpower planning, salary and benefits administration? Or health and safety programs?



Terrifying question number eight
Can you provide a forum—seminars, and so forth—for our personnel, payroll, and data processing people? Can we talk to other users grappling with the same problems? In other words, can you help us keep in touch with the the industry?

Terrifying question number nine
If we can't use our computer, must we shelve the idea? Can we run the system on your computer? Do you have a systems service division to help us do our work? What other clients do they handle? What kind of turnaround can I expect?

Terrifying question number ten
Is your organization stable? Are you financially secure? Will you still be around five years from now if we must expand the system? Are you growing?

InSci Information Science Incorporated

Ask InSci for answers to these terrifying questions. Ask us about our flexible, economical Human Resource System. Check the references of other systems. We've been in this business for eleven years. We'll help you define your needs and show you the best way to get the job done. The difference between sales claims and up-and-running systems is significant. InSci delivers the software and then installs it to your satisfaction. Ask InSci. We have the right answers.

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Western Division
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Called Organized Common Sense:

'SADT' Imposes Methodology on Problem Definitions

By Don Leavitt
Of the CW Staff

WALTHAM, Mass. – At first appearance, the Structured Analysis and Design Technique (SADT) utilized by Softech, Inc. seems very similar to a number of other planning tools. Analysts work with charts made up of boxes with connecting arrows. And the charts are arranged in a hierarchy leading to more and more detail.

But SADT differs from the other tools in nearly as many ways, according to Softech chairman Douglas Ross, who described the methodology recently and invited any interested users to try using it on their own problems.

As its full name implies, SADT is used long before any of the programming-oriented techniques such as conventional flow charts or the IBM-backed Hierarchy plus Input, Processing, Output (Hipo) documentation approach.

Softech's technique is used first in the earliest part of an effort, by a user or analyst, to determine just what problem really exists and what approach might solve it, whether computerization is needed or not.

Along with the charts, however, is a process of review – by both the user and other interested analysts – to make sure that the system being conceptualized is indeed what the user wants and that there are no logical gaps in the design.

Each time a set of charts – or "models," to use Softech's term – is created or revised, it is copied by the author and sent to all who might wish to comment.

The reviewers are encouraged to question any part of the charts that seems unclear or wrong. They are to write their questions, in color so the author won't overlook them, directly on the latest charts and send them back to the author.

He is expected to take all reactions into account, make whatever changes seem appropriate and go back into the review cycle to where there is general agreement on the content of each model.

While "top-down" and "logical decomposition" of a problem are terms applied to both SADT and other recent approaches, the Softech method Imposes physical limits on its charts to be sure the nontechnically oriented user is "comfortable" with them and the design and development staff(s) can attack the problem without fear of leaving out vital pieces.

Physically, each chart can be no longer than an 8-1/2 by 11-in piece of paper, and may contain no more than six "activity" boxes. If it takes more than six boxes to decompose one box from a higher level chart, the analyst has either gone into more detail than appropriate or the higher level chart didn't go into enough detail, Ross said.

The fact that each activity is charted into a simple box is also significant to Softech. SADT has no system of symbolic shapes, as do conventional flowcharts, which often distract or confuse the person attempting to read and evaluate the charts.

The arrows, too, are simpler than with other documentation techniques. The point at which they enter or leave an activity box is important, but the shape of the arrow is not. Input flows into the left side of the box; output leaves on the right.

External factors that control the activity are shown through arrows coming Into the top of a box, and the mechanism the analyst expects to use in performing the activity is "arrowed in" from the bottom. "Last day of month" then, might be an appropriate control factor; "rubber stamp," a reasonable mechanism.

Output from one activity may become input or the controlling factor for another activity, Softech said.

The language used to identify the various activities is also kept simple under SADT, Ross said, noting that verbs are required. "Check Sales Slips" would be better – because it is clearer – than "Edit Input," he explained.

Once activities are detailed enough to identify which might benefit from use of a computer as the mechanism, and the "models" have been accepted by all reviewers, Ross seemed willing enough to allow the detail program designers to use whatever documentation system they wish.

SADT is not viewed by the developers as an alternative to any of the current "structured programming" methodologies. Rather it provides shape to the problem and the solution before programming of any sort is even considered.

Softech is at 460 Totten Pond Road, Waltham, Mass. 02154.

Roman Wall Sets Stage for Lively DP Operation

CHESTER, England – The Roman wall that surrounds this northern English city gives a sense of timelessness in contrast to the problems faced and solutions attained by the Cheshire County Council DP staff which is based here.

The council has an IBM 370/145 with 768K bytes of main memory. The operation is utilizing the Virtual Machine facility (VM/370) in order to ease the change from DOS – the environment since the days of a 360/30 in 1969-'70 – to OS/VS1.

Although confident of his staff's abilities, system engineering manager Ken Croston is not averse to using packages from outside vendors if he feels they can meet his needs better than an in-house effort.

Before VM/370 and its ability to allow concurrent users to work in both OS and DOS, the council had, for example, been using DUO (now UCC-Two) from University Computing Co. to achieve the same basic effect, Croston said.

As they got more deeply involved in the change to OS/VS1, they joined Guide, the IBM user organization, in order to be aware of what others were doing. One direct result of that move was a "face-to-face" confrontation between the Librarian from Applied Data Research and Panvalet, from Pansophic Systems.

Croston was very careful to note, repeatedly, that as hard as his staff could exercise the two products during the test period, he couldn't find any bugs or any trouble at all with either. Ultimately he chose Panvalet and has used it, after "two months of hard work" needed to load some 3,500 program modules Into the source statement library.

Working deliberately, the staff is "getting organized" to put some 70,000 JCL card Images on the system. And in a fairly short time Croston expects to start utilizing Panvalet/On-Line to replace IBM's CMS as a program development environment.

But program development isn't the only part of the council's operations being updated. The systems engineers are now testing their first application destined for use under Cincom System's Total data base management system.

Expected to be operational early next year, it will support both on-line and batch access to police and teachers' personnel records, Croston said.

Panvalet even has a part in the data base work, he added, noting that file layouts, record contents and CRT screen layouts could all be stored in the Panvalet library. This makes it, at least partially, a data dictionary or directory, Croston said.

In addition to the personnel systems for the police and school departments, the council also supports accounting programs for some of the district councils within the county, book ordering and other work for the public libraries and statistical runs for the highway department.

The colleges under the council's control have an on-line enrollment application which is functioning very well, according to Croston. On the other hand, a computer-assisted instruction (CAI) pilot project he tried with IBM was "not very

Croston said the entire DP staff for the council includes some 25 to 30 programmers, analysts and supervisors. These are divided into two teams for development and one, with eight people, for implementation and support – "that's a nice word for maintenance."

The 145 runs 24 hours/five days a week but programmers are not called out at night even if a system crashes. Notes are made and they work on it the next day.

Croston's group of four system engineers functions basically as a technical support group. There is a separate systems programming group of three people, he noted.

'Quick-Trol' Updated

ATLANTA – Quality Data Products, Inc. has announced the release of Version 1.2 of Quick-Trol, a project management system for the DP environment.

Quick-Trol was designed to support in-depth planning and control in the DP environment, with flexibility and ease of use as primary characteristics, the firm said. It enables managers to plan and control multiple work projects with assurance that they have complete traceability and immediate response to informational needs, Quality said.

The enhancements in Version 1.2 include an output exit to interface Quick-Trol with accounting, payroll or other systems; an execution inhibit feature to check for syntactical and data validity and to allow editing of input commands before a final production run, and a dump/restore facility that allows data base expansion at the time of the restore command.

Additional enhancements include a feature that allows automatic creation of project structures and charging authorizations, especially useful for repetitive project formats, the company noted. Special reports that define in detail the contents of the database and the efficiency and usage of the I/O areas and an expenditure verification feature are also part of Quick-Trol.

Quality Data Products can be reached through P.O. Box 76065, Atlanta, Ga. 30328.

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Tymshare's 'Focus' Includes Host Language Linkage

CUPERTINO, Calif. – Tymshare, Inc. has released a data base management system (DBMS) called Focus for the company's IBM 370-based remote computing service.

Focus combines large-scale DBMS capability for DP professionals and reporting and information analysis for the nonprogrammer, the company said. Paired with other analysis tools, Focus was designed to provide comprehensive data management and information analysis capability, according to Tymshare.

A host language interface enables DP professionals to work with programming languages such as Cobol, Fortran, PL/I and Assembler, the company said.

Query Language

Nonprogrammers can use the system's command-based query language to interactively report from and analyze information either in a Focus data base or data residing on in-house tape files. For more rigid analysis and forecasting, a user may employ Tymshare's 370 Express system in conjunction with Focus, a spokesman added.

Focus is said to bring together in one comprehensive information control system the features needed to control an entire application while reducing the need for or replacing programming where desirable.

Focus was developed for one-time reports and for repetitive production runs; once created, the command strings can be stored for later retrieval and execution, the spokesman claimed.

File maintenance as well as data extraction is supported, Tymshare noted.

Focus allows users to deal with a wide range of data structures, including multipath hierarchles and shared hierarchic networks. The user can describe data in a way that is natural and logical for his unique application requirements, the company added.

A match facility allows new relationships to be created dynamically for reporting ~~in~~ unforeseen situations. Focus also eliminates redundant storage since it can "virtually" create new hierarchies using data stored only once, the company said.

Tymshare is at 20705 Valley Green Drive, Cupertino, Calif. 95014.

'Minidump' Update Eases Program Debugging

ARLINGTON, Va. – Data Services Corp. of America has extended the design concept of its original Minidump – to produce a more effective output than IBM's Sysudump – and the update, called Minidump 3, is said to reduce the need for systems programming support in debugging routine application logic.

Designed to cut spool, printer and paper costs as well, Minidump 3 is a general purpose Abend processor that incorporates "intelligent" program dump coding, according to Data Services.

Under control of user-written parameter cards, the software produces a continuum of dumps, which can be selected on a completion code basis, and which range from no dump at all to a complete dump of the CPU's entire main memory.

Commenting on the earlier Minidump, the vendor noted that a program running in 150K bytes of memory will typically generate a Minidump of "just five pages, instead of some 90 pages for a Sysudump."

The package also creates a one-page report on the immediate cause of program failure and a summary of conditions at termination. This report is always produced, regardless of whether a dump is requested or provided, the firm added.

The report provides images of the abending instruction and any data referenced by it. The completion code and operation code are shown in English; for abends within an SVC, the number and function of the SVC are also given.

Significant addresses, including register values, are shown in both absolute form and as offsets into the user program.

An optional feature related to the limited dump provides a formatted display of the Data Language/1 (DL/1) CALL structure and Information Management System (IMS) control blocks, for IBM's data base management system.

Minidump 3 is available for MFT and MVT installations for $2,460. The OS/VS version costs $2,920, and the IMS debug option is an additional $940, Data Services said from 1515 Wilson Blvd., Arlington, Va. 22209.

S/3 Data Retrieval Aided by Package

WEST ORANGE, N.J. – Non-technical personnel whose organizations are using an IBM 3 can perform file audit and data retrieval functions in a "load-and-go" mode with the Sys3audit package, according to the vendor, Computer Audit Systems, Inc. (CAS).

Managed through each run by user-defined control cards, the basic Sys3audit package is capable of parameter value extraction, sequential internal extraction, multiple free format report outputs and selective report sorting, CAS said.

Calculation, sub-totaling, file footings record counts and numeric data error detection are also among its capabilities, the vendor claimed. Parameter card sorting and editing, dual file handling, bypass facilities and user exits permitting use of routines capable of doing things beyond the scope of Sys3audit, are also part of the basic package, CAS said.

Written in IBM 3 assembly language, Sys3audit requires a CPU with 16K bytes of main memory, one disk, a printer and a card reader.

The software is available under a two-year payout plan, which includes two days of installation and training support as well as on-going maintenance, CAS said from 80 Main St., West Orange, N.J. 07052.

"We've tripled productivity and implementation speed. MARK IV has been our salvation!"

By Cecil Wright, Assistant Director
of Operations and Academic Services,
Computer Services
Laurentian University
Sudbury, Ontario, Canada

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"On the academic side, we're doing things like multi-lingual technical dictionaries – a natural task for MARK IV. The text processing features are particularly useful. I plan to teach MARK IV to a number of the people who are doing research. No longer do I have to concern myself with the fact that it takes four months for a trainee to become productive in PL/I. I've brought MARK IV students to the same level in six weeks.

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'Exhibit' Puts OS Resource Data On CRT Screen to Help Operator

ARLINGTON, Va. – The Exhibit package from AMS Computer Center was designed to help operators in their day-to-day work and to help systems programmers in resolving "bugs" by giving immediate information about system resources while they are being used.

Exhibit provides this support by displaying the utilization of a range of system resources, updated every n seconds, on a CRT-based terminal such as IBM's 2260 or 3270. These displays include status of all active tasks, OS Job Queue or Hasp Queue summary data and status of peripheral units, AMS said.

A number of VS-oriented measurements are also available in the pre-defined items to be displayed. Beyond that, Exhibit also enables the operator to request specific details about system operations through some 50 conversational commands.

In conversational mode, the user is free to display the same type of information available in "automatic" mode. But he has access to other data as well, including: details of initiators, JCL or any job in the system, main memory allocation and I/O request information.

But the vendor also noted that Exhibit contains another set of modules designed to help the systems programmer. These modules are said to provide capabilities to abnormally terminate tasks, change the dispatching priorities of tasks and set tasks to non-dispatchable status.

The systems personnel can also use Exhibit to change disk data, allocate data sets, and list disk data, the OS catalog and other system-pertinent information, a spokesman noted.

Exhibit uses approximately one minute of CPU time per hour in normal Display mode; the average overhead does not exceed 3%, AMS claimed.

Exhibit runs under OS/MFT or MVT (release 20 or later), or OS/VS2 Release 1.7, and requires a running region or partition of 12K. The CRT used may be attached to the CPU in local mode or, if TSO is available, in remote mode.

Written in Assembler, Exhibit is distributed in source code on magnetic tape. It can be ordered for $11,500 from AMS Computer Center, 1901 Moore St., Arlington, Va. 22209.

'Roscoe' Gains T/S Option

PRINCETON, N.J. – An option to the Applied Data Research (ADR) Roscoe package allows programs to be executed interactively in time-sharing mode. RTS, the Roscoe interactive time-sharing option, is a monitor routine to aid problem solvers, ADR said.

A replacement for outside time-sharing services, RTS operates without the overhead and complexities of competitive systems, ADR said. It is specifically oriented toward VS environments and accepts applications written in Fortran, PL/I and BAL.

Roscoe is ADR's remote job entry system that provides a conversational approach to program preparation, testing and maintenance via remote terminal facilities.

The types of programs best suited to run under RTS are routines which perform statistical analysis of a set of figures, calculate interest or plot a function, a spokesman explained.

Potential users – engineers, scientists, statisticians and mathematicians – need not be conversant with Roscoe or with the workings of the computer.

Programs to run under RTS must first be debugged and tested using standard Roscoe facilities. When a clean working version is obtained, the Roscoe system manager creates a table entry describing its name, language and file requirements; link-edits the program with a time-sharing front end without modifying the original code, and then places it in the time-sharing library, from which it is available for on-line Roscoe execution.

The new RTS option is available for $7,000 over the Roscoe permanent license fee of $28,000, ADR said from the Route 206 Center, Princeton, N.J. 08540.

Financial Planning Backed by Network

ST. LOUIS, Mo. – Planners have the opportunity to review the past and preview the future of their organizations through the use of two financially-oriented services on the McDonnell Douglas Automation Co. (McAuto) teleprocessing network.

An integrated accounting system, called Autocountant, currently includes modules for general ledger, accounts receivable, sales analysis, accounts payable and fixed asset accounting, McAuto said.

A financial modeling system, called Autoplan, functions independently of Autocountant and permits the user to build a financial model by entering up to 1,500 rows and columns of data on which calculations may be made to evaluate future plans.

While acknowledging that the Autocountant modules can be used as stand-alone applications, the McAuto spokesman emphasized that "maximum benefit" is gained in the integrated systems mode wherein all modules share common master files.

The integrated mode cuts down sharply on the time and effort needed to enter items into the system. All entries into a receivables or payables account by a department are, for example, posted to the general ledger in both summary and detail levels and are reproduced in company- and corporation-level reports, he said.

The McAuto services provide different types of support for financial planners and accountants and those differences are reflected in the way the network charges for the support. Autocountant subscribers are charged for the number of update transactions posted to his accounts and the number of reports printed.

Autoplan costs, on the other hand, are based on the amount of computer resources used since there are no set application logic patterns under this service. Subscribers to either service get training, data entry forms, user manuals and manual updates, the spokesman noted.

McAuto can be reached through Box 516, St. Louis, Mo. 63166.

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Prison, College DP Training Courses Ignore Ethics

J. Daniel Couger On *Education*

While officials and prisoners at the federal penitentiary in Leavenworth, Kan., have vehemently denied recently published stories in the general press alleging inmates were using the prison's computer to defraud the government, few DP professionals should have been surprised by the allegations.

The stories claimed the prisoners cracked the Internal Revenue Service code that determines whose tax returns get audited.

Phony returns were filed and illegal tax refunds were received by inmates still in the penitentiary. One government source believes that a sum between $150,000 and $6 million is involved, the stories indicated.

It would appear that two major issues are involved. One concerns the lack of recognition that our profession is fraud-prone or, if recognized, the lack of corrective action.

The second issue concerns the profession's attitude about fraud. Rather than vilify, we seem more inclined to sanctify people who "break" the system.

Before you accuse me of overstatement, consider the following examples:

Dick Canning told me recently about a West Coast professor who assigns students the task of "cracking" local software security systems.

I've not talked with the professor, so I'll give him the benefit of the doubt and assume his goal is to show students the fragility of some security systems. I also assume he believes this approach a good teaching device to facilitate students' building more secure systems.

I know of other professors who attain vicarious satisfaction from their students' ability to circumvent the university software security systems. Rather than assign students the task of improving the system, one such faculty member seems much more interested in showing how much smarter his students are than the university and vendor software people.

In this particular case and, perhaps, in others, the instructor is under the misapprehension that he made them smarter.

The computer school at Leavenworth is used by selected convicts in a rehabilitation program designed to prepare them for "gainful" employment after their release from prison.

My first knowledge of such rehabilitation programs came from a request for complimentary copies of my publications seven years ago. An Arizona inmate requested the materials for use in the DP course he was taking in the prison's rehabilitation program.

That night I announced to my class it would be only a matter of time before some inmate used his computer knowledge fraudulently.

Is it a mistake to train convicts to be computer programmers? Is it not tantamount to putting a loaded gun in the hand of a proven lawbreaker? Shouldn't prisoners be trained for less fraud-vulnerable professions – like beekeeping or winemaking?

Yet, rather than identify the problem as that of an academician, I wonder if practitioners are not more guilty. Such a view is substantiated by "Letters to the Editor" over the McDonald contest last year.

Many seemed amused that DP knowledgeable students were able to develop a program to produce entries to dominate the contest prize list. These students didn't violate the "letter," but the "spirit" of the contest.

Computer lore includes many such stories and practitioners seem to revel in the telling.

Such actions indicate the ethics of our profession are questionable.

Do students acquire ethics by being assigned tasks of "breaking and entering"? Certainly, it is fun for the students to try to penetrate security systems.

Some say students are more motivated by the challenge of beating the other guy – particularly their "elders" who designed the system.

Others believe students can build ethical values as well as gain knowledge if the emphasis is placed on positive aspects – like helping to build up rather than tearing down a system.

Couger is professor of computer and management science at the University of Colorado.

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Good Manager Needs More Than Technical Background

By Jack Stone

Special to Computerworld

The Human Connection

Dear Jack:

In your article, "DP Managers Must Stop Fire Fighting, Start Managing" [CW, Aug. 9], you said many things I've been saying (less eloquently) for many years. I believe it is possible to achieve the goals you outlined for the profession, but only with great effort.

Just one example: The DP manager's job needs a different external view if we have any hope of applying human dimensions to the job, in addition to strictly operational and technical ones.

As it stands now, the top managers who themselves hire and manage the DP manager don't really want anything more than superior technical talent, often very specific expertise. Technical ability is easier to measure in the hiring process and it provides greater assurance in the day-to-day operation.

The ability to work with and through people isn't even recognized as a job criterion. Maybe it has something to do with the external observation of computing as a mechanistic activity.

The effect is that those people who believe computing is a social activity and who develop leadership skills don't become DP managers.

If I seem glum, it's because I don't see us communicating to others the fact DP management is a separate profession from DP technical activities, requiring less temporal skills and more leadership style.

How can this be done?

Name withheld on request.

* * *

Dear Nameless:

Let's look at management for medium- to large-scale computer centers with the six typical functions of systems planning, systems design, applications programming, systems programming, operations and production control.

Suppose we were to replace this terminology with that which is more conventional and comprehensible to top executives familiar with the long-time established manufacturing job shop (batch processing) or continuous process (on-line processing) custom product business. Let's also identify the DP customers as internal departments.

With the new terminology, we find the DP manager is responsible for, in the same sequence, product sales, design, engineering and drafting, technical services, manufacturing and customer service.

Obviously, then, the DP manager functions as a general manager of an integrated product division, serving the needs of internal departments with high-technology custom products and services.

As such, the manager should possess the broad range of business capabilities, experience and related personality traits necessary to:

- Provide customers with high quality products and services, consistent with established goals of financial profitability.
- Participate as a member in the top level DP management committee responsible for identifying products and services, setting priorities and evaluating performance.
- Develop the planning and decision-making process for all operating functions at a policy level.
- Structure supervisory and employee selection and development programs.
- Interact with user management to ensure customer satisfaction.
- Implement effective internal and external communications programs, particularly in the light of changing conditions.
- Exercise leadership to encourage and motivate employees.
- Set the example of personal commitment, maturity, efficiency, and professionalism.
- Coordinate intradepartmental operations to maximize effectiveness and use of resources and to minimize waste.

A copy of my "Curriculum Guidelines: Operating the Computer Center as a Business Enterprise" is available by request on company letterhead and enclosing a self-addressed stamped envelope.

Readers are invited to write to Stone, c/o Computer Education International, Inc., Suite 222, 2233 Wisconsin Ave., Washington, D.C. 20007, outlining questions, issues or situations pertinent to human relations in the DP setting.

Letters should not exceed 350 words. Writer's name will be withheld from publication, if requested, but should be included for acknowledgement purposes.

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Trio of Books Show Agreement on Good Program Style

By James Douglas

Special to Computerworld

Good programming style like structured programming is everyone's goal. But unlike structured programming which has no universally accepted definition, most people can agree on what is good programming style. There are three good books on the subject.

- Kernighan; Brian W. and Plauger, P.J., *The Elements of Programming Style*, (McGraw-Hill Book Co., New York, N.Y. 1974, 145 pages).

This is a nice little book. These two authors have taken programs from programming texts and used them to show how not to program. The programs used are inefficient, unstylish and often incorrect.

Since all these bad examples of programming were taken from programming textbooks, one would have expected better programs. The authors have been kind enough not to indicate from which books they took the bad programs.

The book uses examples in PL/1 and Fortran, but no Cobol. Each section terminates with some nice rule that can be remembered to help improve programming style.

All in all the book is quite good.

- Ledgard, Henry, *Programming Proverbs* (Hayden Book Co., Rochelle Park, N.J., 1975, 130 pages).

This book is patterned after William Strunk's *Elements of Style*, which is a good book on English style. Ledgard includes many proverbs to improve programming practices and gives examples in several languages.

In fact, he often gives the same example in four languages, which seems a little unnecessary since one can usually figure out the example without having it in one's own programming language.

Basically the book is all right, but not up to the quality of the other two.

- Van Tassel, D., *Program Style, Design, Efficiency, Debugging and Testing* (Prentice-Hall, Inc., Englewood Cliffs, N.J. 1974, 250 pages).

This book was the first book on programming style. All the common sense rules are included and examples in several languages including Cobol, PL/1 and Fortran are given.

This book has extensive exercises and references which were not included in the two previous books. Several other topics are discussed, as indicated by the title.

The book is quite good and covers a lot of territory.

Douglas is an independent programming consultant in Sausalito, Calif.

Edutronics Adds Module on Vtam

KANSAS CITY, Mo. — The flow of control and the flow of data within IBM's Virtual Telecommunications Access Method (Vtam) are highlighted in an audio/visual course module on Vtam now available from the Edutronics Group.

Vtam provides a method of communicating with terminals in a network. It allows dynamic linking of terminals with distributed processing and is "vital" to dealing with IBM's System Network Architecture (SNA) and Synchronous Data Link Control (SDLC), according to Edutronics.

The course module illustrates, through animation techniques, how two programs can be handled alternately on the same terminal and the same line or through two terminals on the same multidrop line without stopping or starting either program, the vendor added.

The course module is available in 3/4-in. video cassette, "Super 8" cassette or 16mm film formats and is supported by a study guide, a spokesman noted.

The course module is available by itself or as part of a general rental system which provides use of all Edutronics courses on a "revolving" basis.

Cost varies depending on the number of courses utilized, the firm added from 3435 Broadway, Kansas City, Mo. 64111.

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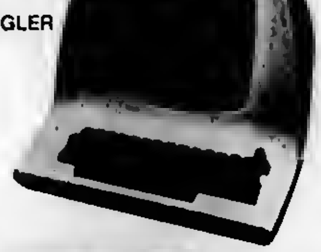

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Describe Innovative Services

Independents Warn Bell Bill Threatens Their Existence

By Ronald A. Frank

Of the CW Staff

WASHINGTON, D.C. – Two of the carriers offering services not duplicated by the Bell System recently told the House Subcommittee on Communications their existence would be threatened if the AT&T-fostered Consumer Communications Reform Act of 1976 were passed.

Philip Walker

Philip Walker, vice-president and general counsel for Telenet Communications Corp., said his company is now providing packet-switched services to more than 80 customers in the U.S.

Walker traced the evolution of packet switching from its development by the Department of Defense's Advanced Research Projects Agency (Arpa). "Bell Labs did not invent packet switching," he stated.

If the Reform Act had been law in 1974 when Telenet filed an application with the Federal Communications Commission (FCC), "Telenet would have had the burden of proving to the FCC that AT&T was incapable of offering this service either now or in the future."

If Telenet could not have proved that Bell Labs would have been unable to develop a packet-switching technology, it would not be in existence today under provisions of the Bell legislation, Walker said.

A number of Telenet customers with interactive and data base applications were unable to utilize data communications in an economic manner under the conventional carrier services; packet switching made nationwide access to computers an economic reality for these users, Walker said.

"Now, three years after Telenet's initial application, AT&T is beginning to put its toe into the packet-switching waters with its introduction . . . of a service called Transaction Network Service," he noted.

"One must speculate as to whether, if ever, AT&T would have found it expedient to offer the data communications user a packet-switched service" if Telenet did not exist.

Another innovator of services was American Satellite Corp., which "demonstrated a responsiveness to the special service requirements and new service needs of private-line users," according to Emanuel Fthenakis, the firm's president.

These services to users are not "cream skimming," as AT&T claims, but rather satisfy needs which users were unable to fulfill elsewhere. Among the satellite facilities provided to users are on-premise earth stations for high-volume data communications at high transmission speeds, he said.

American Satellite entered the industry when AT&T was claiming satellite transmission was unreliable, of poor quality and suitable only as backup for existing terrestrial communications systems, but AT&T was proven wrong, Fthenakis said.

Users Seen But Not Heard Much

WASHINGTON, D.C. – Testimony from users was virtually nonexistent at the recent hearings here on the proposed AT&T-sponsored Consumer Communications Reform Act, but some informal user views were given.

Almost all the witnesses represented vendors, carriers or regulatory agencies. Two industry groups of communication users were represented by witnesses from Aeronautical Radio, Inc. and the Securities Industry Automation Corp.

Each described to the House Subcommittee on Communications how they rely on a uniform nationwide network and each hinted separate standards set up by state regulatory bodies would make it more difficult to conduct business.

Users were present at the proceedings, however, and Robert Bennis of Westinghouse and Graham Crawford of Sears Roebuck listened intently to the testimony. They were attending both as telecommunications managers for their companies and also as members of the Regulatory Liaison Committee of the International Communications Associations (ICA).

Although ICA bylaws prohibit members from giving testimony in regulatory proceedings, both users reportedly had an informal exchange of opinions with subcommittee members.

Representatives of the time-sharing group of the Association of Data Processing Service Organizations (Adapso) and the Dictaphone Corp. had been slated to testify, but neither appeared.

Variety of Products Bow on Show Floor

By John P. Hebert

Of the CW Staff

SAN DIEGO – Paradyne Corp. and International Communications Corp. (ICC) introduced data communications products on the exhibit floor of the Tele-Communications Association (TCA) conference here recently.

The show offerings included intelligent modems, intelligent multiplexers, network control systems and telephone-controlled network switches.

Paradyne introduced a microprocessor-based 4,800 bit/sec synchronous modem, the Micro-Processor 48, for operation in multipoint, point-to-point or switched environments.

The intelligent modem can digitally perform under program control all calculations for automatic adaptive equalization, line filtering, signal modulation/demodulation and data randomizing, according to a Paradyne spokesman.

It was designed to meet CCITT V.27 specifications and can therefore be utilized in both American and European networks, he said.

Paradyne also introduced the Analysis I multipoint network management and restoration system.

Analysis I is an automated system for multipoint system management; equipment such as bit error rate testers and line analyzers are replaced by this system.

The Autoscan network interrogation procedure utilized in Analysis I analyzes diagnostic data from every network drop on a noninterfering and continuous basis, the spokesman noted, adding all nonacceptable states are displayed on the operator console along with recommended restoration procedure.

CW
At TCA

Paradyne's Micro-Processor 48 with standard, 2,400 bit/sec fallback capability is priced at $3,000 or $105/mo on a two-year lease including maintenance. The Analysis I system cost depends upon user configurations. Paradyne is at 8550 Ulmerton Road, Largo, Fla. 33540.

ICC spotlighted three introductions at the show, including a microprocessor-based interactive CRT terminal, an intelligent network diagnostic controller and a minicomputer-based communications monitoring system.

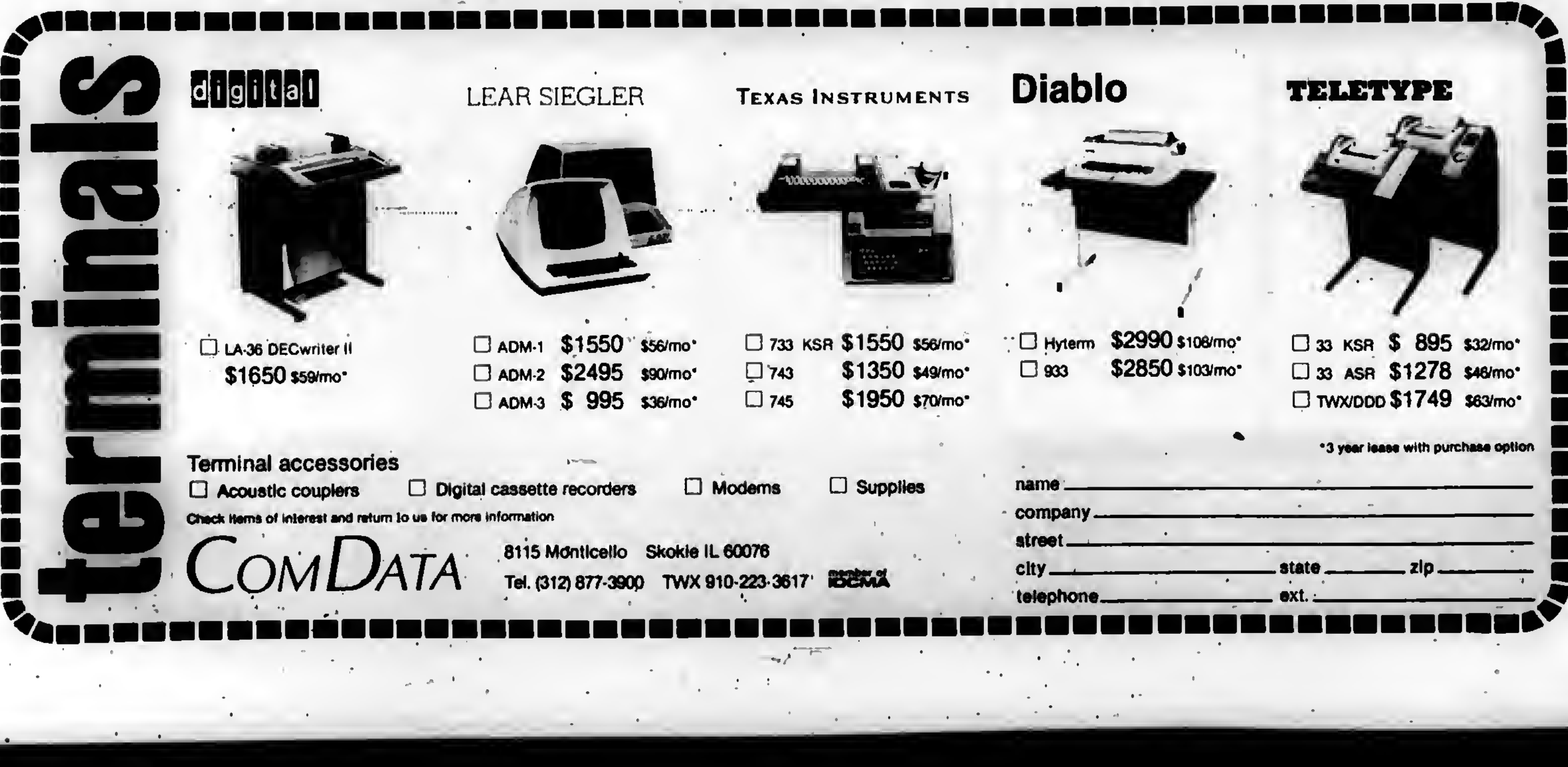
The System 200 Technical Control Center Management System is a programmable, modular communications monitoring system capable of surveilling up to 16,256 locations on 16 to 24 channels.

A minimum System 200 configuration consists of a minicomputer, two disk drives with removable cartridges holding almost 5M bytes of data and a controller; a serial interface multiplexer; 30 char./sec printer; keyboard/CRT; and the Model 200 control console.

The System 200 can extend control through various levels of remote modems or data concentrators, ICC said.

ICC's related product, the System 180 network diagnostic controller, is intended for multipoint and point-to-point networks and is reportedly capable of controlling four to 16 central lines with 254

(Continued on Page 27)



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DPers Seen Usurping Data Specialists' Jobs by 1980

By John P. Hebert
Of the CW Staff

SAN DIEGO – The time when there will no longer be a need for the separation between data processing and data communications is fast approaching – "it will happen in this country before 1980," in the opinion of Leland Reeder, president of Correlator Corp., a firm specializing in education of teleprocessing principles.

"DP has developed into a highly sophisticated management tool and DPers know their job. You can bet they are learning yours," Reeder warned a workshop at the recent Tele-Communications Association (TCA) conference here.

This stems from the advent of true digital communications with the development and utilization of LSI technology in the early 1970s acting as a catalyst, Reeder said.

AT&T will offer something Reeder coined "network processing" by the 1980 time frame, he predicted. This concept involves digital computerized switches to process information at the network level after input, he explained.

As an argument for network processing becoming a reality, Reeder gave his "judgmental estimates of additional Bell offerings in response to IBM's Satellite Business Systems [SBS] joint venture and IBM's full-scale entry into the minicomputer arena."

In the 1977 time frame, SBS will come out with digital transmission services and, by 1977 or 1978, IBM itself will offer a digitized facsimile unit, he said.

CW
At TCA

Further predictions of DP inroads into the telecommunications and teleprocessing areas included a Bell System response to IBM's actions with a competitive entry into the teleprocessing field in 1978.

In 1979, Reeder noted, SBS will initiate digital satellite transmission services. "SBS will offer totally integrated teleprocessing switches. These switches will provide digitized voice and data communications and serve as message switchers," he forecast.

In addition, he said, voice communications switches will vanish and be replaced by teleprocessing switches – a move which will act as a link in the chain of events to eliminate the communications function with the subsequent offering of the network processing concept by 1980.

"This will change our teleprocessing function. Where will we fit then?" he asked.

"DP will dictate all directions of teleprocessing. Teleprocessing people will assume a clerical function" when the concept of network processing is instituted, he answered.

DP personnel "are prepared to do our jobs, but there is a way out – a way we can balance the scales.

"It's up to you, and it all depends on education," Reeder told the audience.

Variety of Products Bow at TCA Exhibit

(Continued from Page 26)

remote devices per line.

The System 180 performs fault isolation in ICC modem networks equipped with a special multipoint test and control feature, the spokesman noted.

A basic four-line configuration costs $4,900; central office 16-line system is priced at $7,900.

In addition, ICC brought out the System 400 display terminal compatible with IBM 3275 and 2265 protocols as well as Univac's Uniscope 100/200 and UTS 400 and Honeywell VIP 7700 protocols.

An ICC spokesman said it was basically a Model 40+ terminal with a different microprocessor and control logic. The System 400 operates under synchronous or asynchronous line disciplines at speeds up to 9,600 bit/sec, has a removable keyboard and can be coupled with buffered and addressable printers capable of speeds up to 275 char./sec, ICC said.

The System 400 price is protocol-dependent and ranges from $4,200 to $5,800.

General Datacomm Industries, Inc. demonstrated the Netcom-5 network diagnostic control system designed for central system control and monitoring of all remote subscriber stations in a polling network.

The system can be utilized in any multipoint system utilizing Bell 201, 202 or 208 types of modems, the vendor said.

The microprocessor-oriented system allows on-line tests and is said to be data-transparent and insensitive to code, speed or protocol of the main data stream.

The system costs $7,500 for equipment necessary at the central site and $750 for each remote site. General Datacomm is headquartered at 131 Danbury Road, Wilton, Conn. 06897.

T-Bar, Inc. of Wilton, Conn., unveiled Touch-Tone types of telephone-controlled switches designed for unattended remote teleprocessing. Switch functions currently available include analog transfer, analog loopback, antistreaming, modem transfer, digital loopback and terminal transfer, T-Bar said.

The switches cost from $1,385 for an antistreaming switch to $2,140 for a multiple switch unit.

A product similar to the T-Bar switches was introduced by Dynatech Laboratories, Inc.'s Cooke Engineering Division in Alexandria, Va.

Dynatech's dial-up accessed fallback switcher also operates remotely from any Tone-type telephone. It provides fallback switching of the RS-232 digital interface on an individual or group channel basis, according to a Dynatech spokesman.

The Dynatech fallback switcher with one-digit security code, auto disconnect and eight-channel capability costs $2,700; a 16-channel switch is priced at $3,400.

Infotron Systems Corp. brought out the Timeline 780 Supermux, an intelligent time division multiplexer that Infotron claimed retransmits when it detects errors.

The 780 can transmit at speeds up to 19.2 kbit/sec, he said, adding it costs $2,700 to upgrade to the 780 from a Timeline 180 or 240 or $4,300 for the capability excluding channel adapters and interfaces, which cost an additional $150 each for up to 18 channels.

COMPUTER MANAGEMENT
United Kingdom

World rank as DP market: *Fourth*
1975 DP expenditures (1): *$2.7 Billion*
1975 imports from US (2): *$270 Million*
Rank as importer from US: *Third*

Computer Management is a monthly magazine recently purchased by Computerworld, Inc. Monthly circulation is 30,000.

COMPUTERWOCHE
Germany

World rank as DP market: *Third*
1975 DP expenditures: *$3.7 Billion*
1975 imports from US: *$274 Million*
Rank as importer from US: *Second*

Computerwoche is a weekly tabloid newspaper started by Computerworld, Inc. It has a circulation of 21,000 to the West German computer community.

SHUKAN COMPUTER
Japan

World rank as DP market: *Second*
1975 DP expenditures: *$4.6 Billion*
1975 imports from US: *$189 Million*
Rank as importer from US: *Fifth*

Shukan is a weekly tabloid newspaper, jointly owned by Computerworld and Dempa publications. Circulation is 35,000.

Zero-Un Informatique
France

World rank as DP market: *Fifth*
1975 DP expenditures: *$2.5 Billion*
1975 imports from US: *$223 Million*
Rank as importer from US: *Fourth*

Computerworld represents **Zero-Un Informatique** in the U S. Zero-Un has three publications, one a weekly tabloid newspaper with circulation of 22,000, the second a monthly magazine, circulating 13,000 copies, and a new bi-weekly, Minis and Micros. All circulate throughout Europe's French speaking computer market.

DATANEWS
Brazil

World rank as DP market: *12th*
1975 DP expenditures: *$250 Million*
1975 imports from US: *$60 Million*
Rank as importer from US: *(Est) 10th*

DataNews is a bi-weekly tabloid newspaper in Portuguese with an English-language summary. It is owned by Computerworld, Inc. and has a circulation of 7,000.

Notes:
(1) These figures are estimates of International Data Corporation, the world's largest EOP Market research firm.
(2) Import figures come from the US Department of Commerce, and include only computers and computer-related products manufactured in the United States by US firms. Many US firms also manufacture abroad, and those products are not counted.

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COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

For Survival of Free Enterprise

Communications People Warned to Get Into Politics

By John P. Hebert
Of the CW Staff

SAN DIEGO – "People in business and especially in the communications industry must become more involved in politics if our system of free enterprise is to survive the next century," R. Parker Sullivan, president of General Telephone and Electronics, warned communications experts here last week.

"If it became necessary to select a word that most accurately describes communications today, I'd pick 'change,'" Sullivan said in a Tele-Communications Association conference keynote address entitled "The Second Hundred Years."

Turning almost immediately to the theme of government regulation, Sullivan used the Consumer Communications Reform Act of 1976 as an example "of the kind of basic change we are all facing in telecommunications.

"There are a growing number of regulatory decisions that are challenging the concept of undivided service from telephone companies. These decisions have forced change on you users," he said.

After assuring his audience he was not going to make a pitch for the Reform Act, Sullivan said he "simply believes we are going down a path which is marked by such names as Carterfone, MCI, the [Federal Communications Commission (FCC)] and others which, in my opinion, led to a contrived form of competition and to a fragmentation of the responsibility to provide telephone service."

There were a growing number of regulatory decisions made by the FCC – such as the open entry policy – which challenged the concept of undivided service from the telephone companies, he said.

"We do not fear competition. We do believe that whatever the competitive situation, it should be fair and equitable," as set forth in a responsible decision by the FCC.

CW
At TCA

"We have the responsibility to point out what, in our opinion, will be the adverse effects the FCC decisions will have on the quality of telecommunications service rendered nationally and on the price residential and business users of basic telephone service will have to pay for that service," he continued.

"For us to acquiesce quietly to the FCC's method of experimentation at the moment" is akin to suicide, according to Sullivan, who reportedly is active in the U.S. Independent Telephone Association and other industry groups.

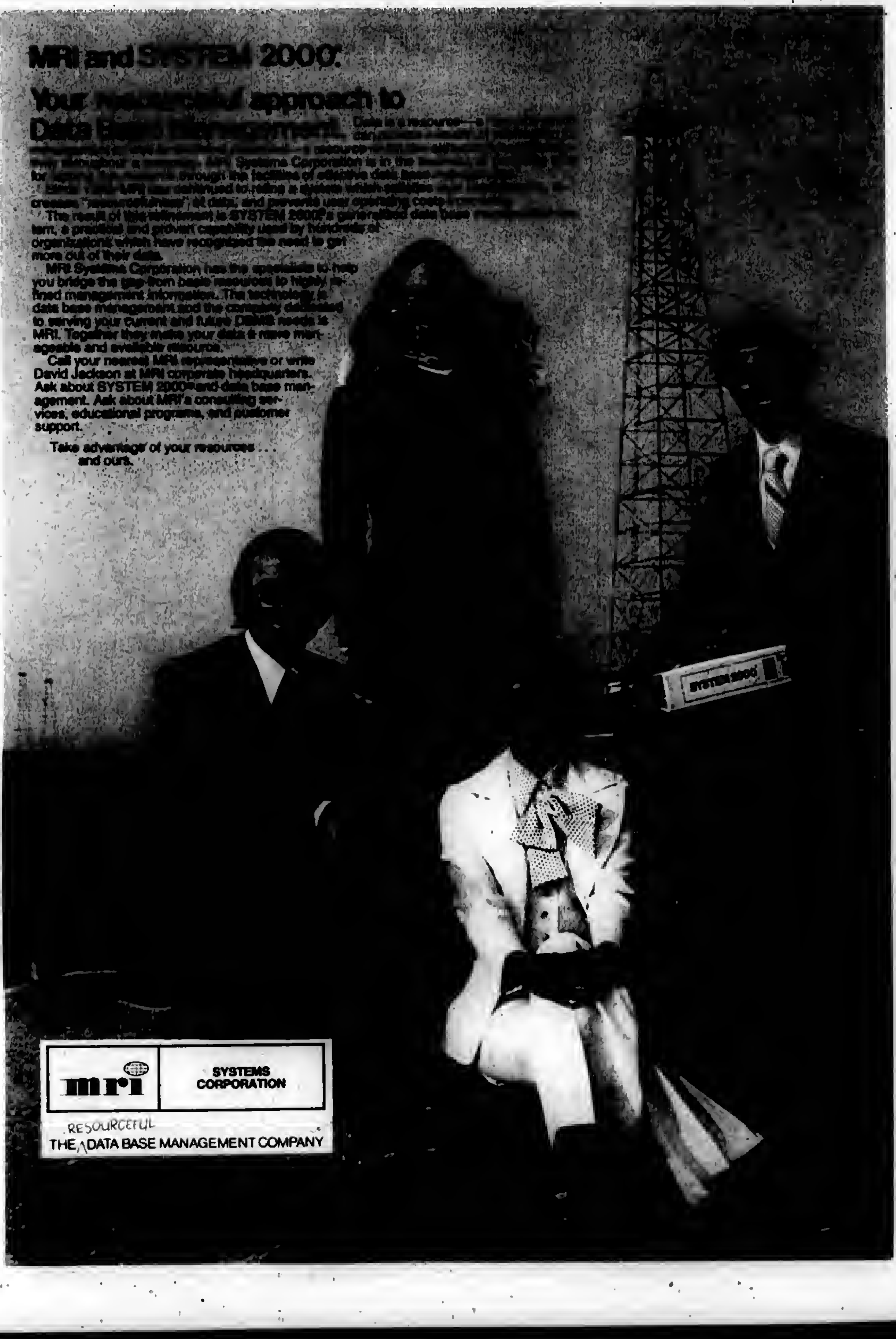
Sullivan completed the thought with a warning to attendees that the communications Industry is rapidly becoming a victim of "stifling regulation" – the same kind of regulation that put the railroads out of business.

"The chaos that has been created by the FCC is of major concern today," he continued, adding the entries by common carriers into the communications marketplace are fine if they don't drive the cost of communications prohibitively high, especially for the American people.

"We in business have to get involved in politics because our economics and political systems are under attack," he reiterated.

Sullivan summed up a view toward the second hundred years of electronic communications as being a panorama of danger signals. He cited figures which showed the federal tax receipt over the past few years to have increased two-thirds faster than individual income because of government overspending.

"We are in the communications business and now know best how to effectively participate in government on all levels, [better] than at any other time in history. Let's do it," he urged the conference audience.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Adaptor from Cetec Backs Modem Sharing

SANTA CLARA, Calif. – The DMC Division of Cetec Corp. has introduced the DMC 1001 shared modem adapter which is said to provide a method of reducing line and modem cost at multiterminal offices.

The 1001 allows up to four I/O devices to access one modem in a dedicated environment and is code- and protocol-transparent, the company said.

The adapter is priced at $225 for a two-channel system and $300 for a four-channel system.

Prices include one-year warranty coverage based on unit replacement by way of overnight depot shipment in the continental U.S. and Canada.

DMC is located at 2300 Owen St., Santa Clara, Calif. 95051.

Bankcom T/S System Supports Bank Terminals

SCHILLER PARK, Ill. – Bank Computer Network Corp. (Bankcom) has a microprocessor-based time-sharing (T/S) terminal support system which it said allows banks to support multiple automated teller machines, teller information terminals and point-of-sale devices around the clock with or without the assistance of a host mainframe.

The Insta-Share operating software is a true multitasking multiprocessor with extensive interlocking security, a spokesman claimed. It has the capacity to converse with a bank's host CPU to update its own files on a real-time basis, he added.

Insta-Share can be used as a file inquiry backup when the host CPU is down or during the night and on weekends.

Monthly leases begin at $1,000 and purchase prices start at $25,000 including disks, processors and software, Bankcom said from 10501 Delta Parkway, Schiller Park, Ill. 60176.

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The Idea software is designed to work with INFOS (our data management software). It's so powerful that all your users can get at the same data at the same time. And so easy to use that they can access data records even if they know only half a reference.

And you won't have to worry about a lot of duplicate data. Because INFOS is designed to provide a single source of information that's always up to the minute.

Also, Idea software runs on our new ECLIPSE C/330 and C/300 commercial computers. They have just what's needed to keep all your users' information up to the minute. Because they run the Real-time Disc Operating System that controls multiterminal applications concurrently with batch or telecommunications jobs. And the commercial ECLIPSE computers include ADD, MOVE, COMPARE and decimal arithmetic instructions designed specifically for commercial applications.

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TDM Features Six Channels

WILTON, Conn. – The TDM 1203 from General Datacomm Industries, Inc. is a six-channel maximum, fixed configuration time-division multiplexer (TDM) intended for remote extensions of a data network.

Primarily designed for asynchronous data channels with speeds up to 4,800 bit/sec, the device is also capable of accommodating synchronous communications from 600 bit/sec to a high-end transmission speed of 72 kbit/sec with common logic capabilities, according to a spokesman.

The character-interleaved TDM works with EAI, current loop, MIL or built-in modem channels for applications in low-density systems, he said.

The unit, which utilizes LSI technology, is said to feature automatic service restoral, TDM diagnostics, integral modems for channels and simplified maintenance.

The 1203 can be configured in multiples at a central location to provide star node operations over an unrestricted number of high-speed lines, General Datacomm claimed.

Besides the inclusion of status displays and loopback tests for common logic and high-speed stream performance, the TDM automatically detects channel alarms.

A common alert alarm signals a multiple channel outage indicating failure of equipment at either end or the failure of a transmission line.

The TDM 1203 can be utilized as a submultiplexer on a single Bell Digital Dataphone Service line where multiple lines are in use, the spokesman noted.

The TDM 1203 costs $2,000 and comes equipped with the six-channel capacity, the spokesman noted from 131 Danbury Road, Wilton, Conn. 06897.

'Kit' From Datatrol Gives Banks Way to Try Out, Start Up EFTS

HUDSON, Mass. – Datatrol, Inc. has introduced a communications-oriented electronic funds transfer system (EFTS) "kit" aimed at financial institutions.

The EFTS-32 Pilot System is an inexpensive way to install a trial or start-up communications network for check guarantee and verification, charge authorization, funds transfer and other retail and banking transactions, the vendor claimed.

Datatrol's FT-32 financial terminal is the basis of the system. The EFTS-32 includes 20 FT-32s with integrated 1,200 bit/sec modems, wipe-through card reader and personal identification number (PIN) pad; and one Datatrol RC-1500 communications concentrator/controller configured for two phone lines and connection to a host CPU, Datatrol said.

The FT-32 incorporates a 10-digit LED display, 16-button keyboard, a 12-window message indicator panel and an LSI microprocessor, according to the company.

Four Terminals Per Drop

The terminal requires only a telephone drop, the company said, noting up to four FT-32s can be clustered on one telephone drop.

Communications to the host CPU are by standard asynchronous protocols (IBM 2858/2260 and NCR 795/720) or bisynchronous protocols (IBM 3270). The Pilot System includes all asynchronous modems necessary, but does not include bisynchronous modems, according to Datatrol.

Firmware in the controller and terminals is table-driven but is said to allow options to the user. To minimize cost and implementation time, however, the application is standardized, Datatrol added.

At the conclusion of a test period, alternatives are available from Datatrol to expand the system if necessary.

The EFTS-32 Pilot System costs $30,000 for the asynchronous version and $35,000 for the bisynchronous system. Deliveries are scheduled for early next year, Datatrol said from Kane Industrial Drive, Hudson, Mass. 01749.

HP Adds Terminals For Novice Operators

PALO ALTO, Calif. – Hewlett-Packard Co. (HP) has introduced the HP 3070A and HP 3701A terminals for use in industrial and commercial applications by operators with little experience.

The HP 3070A works with HP 2100 and HP 21MX computers and the recently announced HP 1000 system. The 3071A can be used with computers of "most other manufacturers," HP said.

Both models can be tailored to the user's application, have numeric-only keypads for entering data and have 16-digit numeric displays.

The terminals have a set of keys and LED indicators that can be labled to match computer programs prepared by the user. This keyboard and prompting-light labeling technique make it easy to customize the terminals, HP said.

Up to 56 HP 3070A terminals can be connected to the HP 1000 system via a single twisted-pair cable, the company added.

The HP 3070A costs $1,308 and the HP 3071A $1,143 in quantities of 10. Deliveries will begin next month from HP at 1501 Page Mill Road, Palo Alto, Calif. 94304.

RDS Version of DEC Printer Features RS-232 Interface

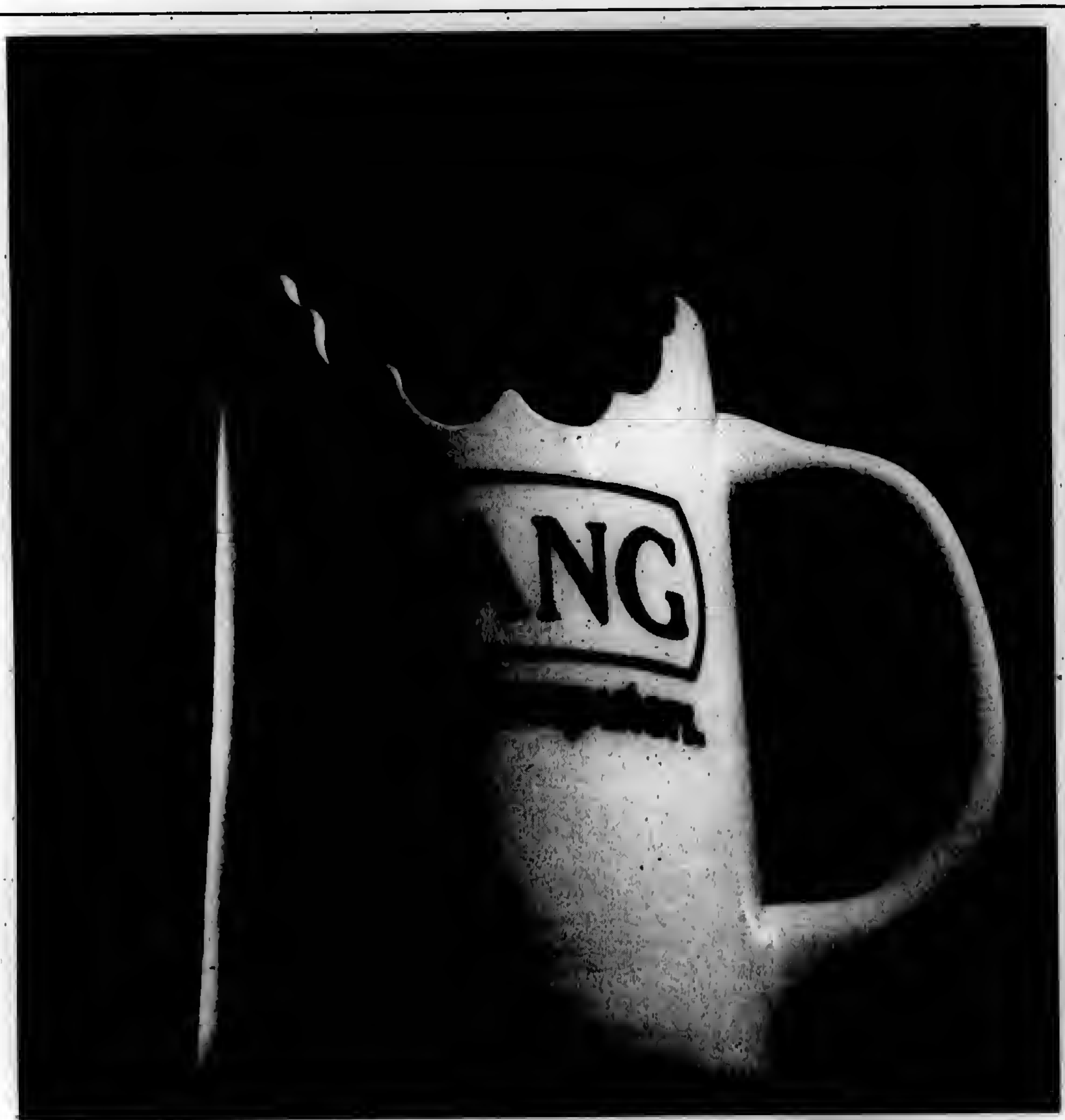
TORRANCE, Calif. – Randal Data Systems (RDS) has a communications terminal version of the Digital Equipment Corp. LA180 printer.

The RDS/LA180 printer terminal features an RS-232 interface with 512- or 1K-character buffer and a polling capability for network applications, according to a spokesman.

The terminal also features block transmission and error correction capability, he said. The basic characteristics of the DEC model are unchanged.

Standard features include 180 char./sec operation, variable-length forms accommodation up to 132 columns, an upper/lower case, 128-character Ascii keyboard and 7 by 7 dot matrix.

The RDS/LA180 with RS-232 interface costs $3,735 from RDS at 365 Maple Ave., Torrance, Calif. 90503.



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CW 10/76

Criterion Users Planning Many On-Line Applications

By Esther Surden
Of the CW Staff

Present and future users of the Criterion systems from NCR Corp. are planning increased on-line applications.

The Criterion at Robertson's Factories, Inc. will help the company connect its nine manufacturing plants to its central location in Taunton, Mass., for inventory control. The firm plans to go on-line with terminals in each of the plants, according to Ibrahim Abdallah, DP manager.

All the inventory control facilities are off-line at present, he explained. Although the company believes in the philosophy of centralization, the turnaround time is slow, he said.

With the Criterion, purchased as an upgrade to a Century 200, the firm hopes to be better able to "control usage of cloth and to be in a better position to put through orders for cloth based on how trends are developing," Abdallah said.

The company manufactures draperies, curtains and bedspreads. All ordering and purchasing is centralized and, since the company must deal with the variables of styles, colors and sizes, the files are huge, another reason to upgrade to a system able to accommodate more disk storage, he said.

That and the fact that the Criterion features multiprogramming and will be a "virtual machine" able to cover the company's requirements for the next several years, sold Abdallah on the system.

"We looked at the IBM 370 and Burroughs systems, but found the Criterion will give us the equivalent to the 370 for less money," Abdallah said.

Century 'Rather Limited'

Tri-State Oil Tool Industries, Inc. is also upgrading to the Criterion from a Century, according to Dennis Brewer, DP manager of the firm. The company specializes in the rescue of drilling equipment lost or fouled in the drilling shafts of oil wells.

Faced with growth that has tripled in the last two years, the company plans to use CRTs in a real-time environment, a capability that was "rather limited on the Century system," Brewer said.

"The Criterion is much faster, it's a state-of-the-art machine and we don't really foresee outgrowing it. We can upgrade in the field from the 8550 to the 8570 without obtaining a new processor," he added.

The firm will perform all of the basic accounting functions, such as general ledger, payroll, accounts payable, sales and order entry on the system, he said.

"We plan to give people the capability of a CRT at their desks, and we will process different people's data all at the same time; right now we have a batch system and have to put the data in and send it through keypunching, and there is a lag time.

"We are going to update the files at the same time the person inputs the transaction and we hope this concept will grow into a communications system. We are starting in the office itself, but afterwards we may be able to bring communications to our about 28 outpost stores in the continental U.S."

The company plans to use Cincom Systems' Total data base management system, he added.

'Normal' for Hospital

The Criterion at St. Anthony's Hospital in Denver has 256K of memory, a 600 card/min card reader, five NCR 658 disk units, two magnetic tape systems, a 2,000 line/min printer, a communications multiplexer and several CRTs.

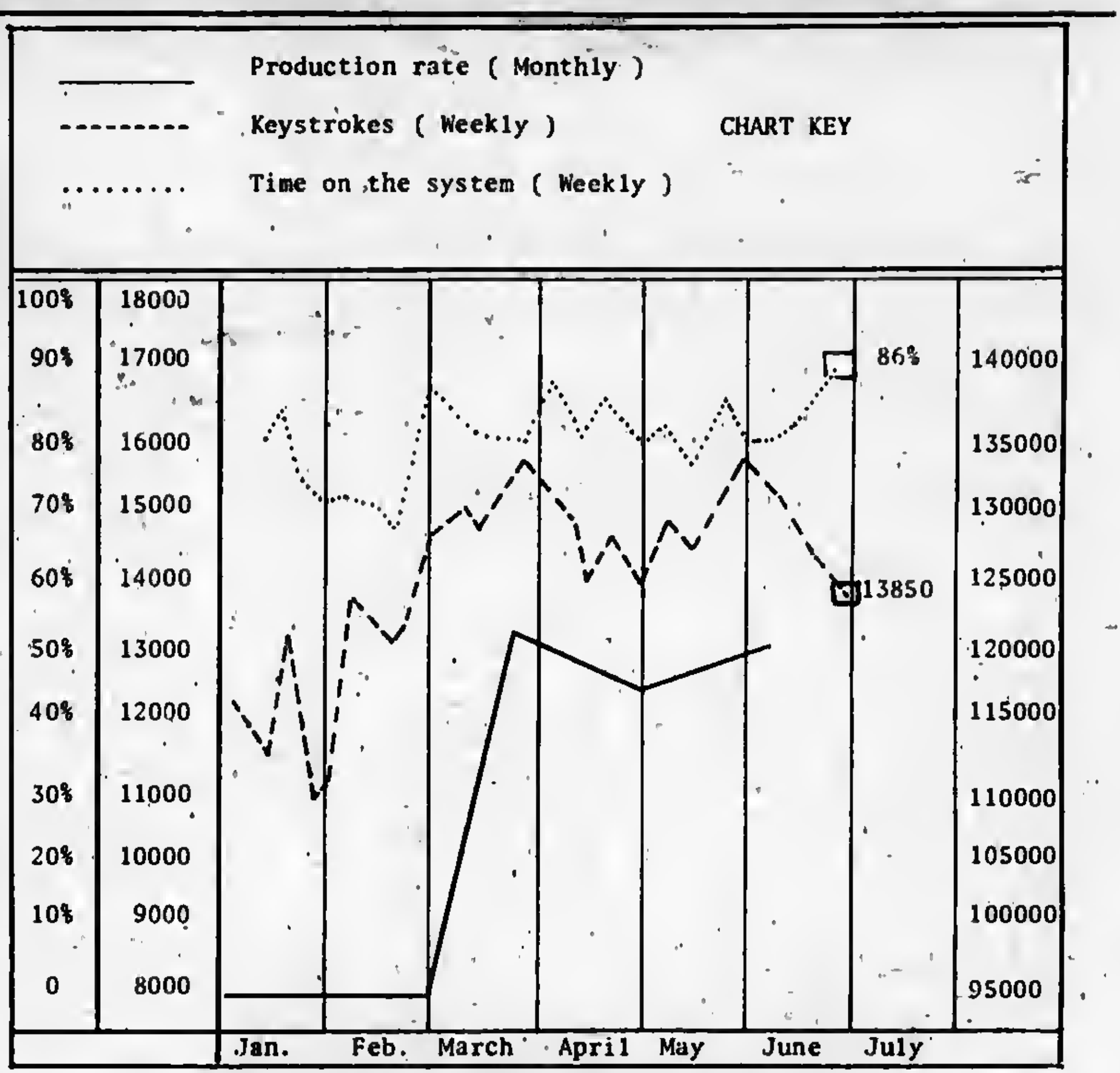
"We consider this a normal upgrade," John L. St. John said.

"One of our concerns was multiprocessing, and we looked at a configuration using the old Century for multiprocessing, but it was much more expensive than the Criterion," the director of management information systems said.

"We have experienced, in the three weeks since the system was installed, a 60% increase in throughput," he added, noting the system is still in the process of certification.

The hospital hopes to put some teleprocessing applications on the Criterion and is "looking seriously" at NCR's

(Continued on Page 32)



Plotting Performance

The *Data Entry Management Newsletter*, in an effort to provide its readers with information on determining key-to-disk operator efficiency, published the above chart submitted by Barbara White, a supervisor at New Hampshire Blue Cross.

The chart shows time on the system determined from a log clocked on the key-to-disk unit. Based on a 40-hour week, the above operator was on the system 34.4 of the 40 hours.

The 13,850 represents the operator's average strokes per hour on the system.

The production rate was determined by multiplying the keystrokes by the time on the system, which White said probably shows the more meaningful keystroke figure for comparison.

The newsletter is published by the Data Entry Management Association (see related story on Page 32.)

System Running in Three Days

'Ho Hum' Says User of Upgrade to Criterion 8550

LOS ANGELES – The first NCR Criterion 8550 user described his upgrade from the previously used NCR Century system as a "ho hum affair."

The Criterion 8550 was installed on April 5 and began processing three days later, according to Jerry Lindee, director of information systems at Dart International here.

The firm, which operates a fleet of 1,350 equipment pieces, provides distribution services including property development and management, office rentals, vehicle leasing, local deliveries, line hauling and harbor transportation, Lindee said.

The initial Dart in-house computer installation in 1971 implemented a series of distribution management and control programs developed partly by an outside software firm and partly by the information processing group set up under Lindee at that time.

Applications switched over from a service bureau included purchase order processing, freight billing, bill of lading processing, customer invoicing for distribution management services, payroll and fleet maintenance reporting.

The work was done at the outset on a 32K NCR Century 200.

This DP activity coincided with a major business expansion program that saw the company's total fleet expand from 500 to 1,350 pieces, Lindee noted.

Dart's philosophy has been to change only one system component at a time and to concentrate all of the department's limited resources on supporting each significant modification, he explained.

Since 1971, such major changes have been continually in progress at Dart.

Dart inevitably reached a point where it was "bumping the ceiling" of a Century 201's capacity and still looking for upward-compatible expandability, Lindee said. At about the same time, NCR representatives began the process of picking customer pilot sites for the Criterion.

Dart was chosen because of a combination of factors, including its expansion plans, the qualifications of Lindee and his staff and the proximity of the installation to NCR's main computer manufacturing complex at Rancho Bernardo, Calif.

The initial installation plan was simply to plug in a new mainframe and card reader, leaving all peripherals as they were, and continue with business as usual.

(Continued on Page 32)

Three guesses whose serial printers topped the Datamation Brand Preference Study in '74, '75 and '76.

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V 10 41 OCT 11 76 UMI

Dema Formed to Represent 'Neglected' Management

By Esther Surden
Of the CW Staff

GREENWICH, Conn. – "The computer industry has traditionally given representation to the DP manager, systems manager and systems analyst, but one level has been neglected – the data entry management," according to Norman Bodek, the founder of the Data Entry Management Association (Dema).

The first meeting of the recently formed organization [CW, Sept. 13] is scheduled tomorrow in Chicago.

The association was established for those people in charge of data entry installations either within companies or in service bureaus, Bodek said.

"There was no place for this level of management to really go. Here you have someone who has a responsibility that equals about half of all the money being spent today in the DP area, but who normally has been at the low end of the prestige level, he added.

The first objective of the organization will be to raise the professionalism of people involved in data entry. "If we can share the best of what we have, all of us can grow," Bodek said. "We want to set up the means to facilitate the sharing of information through a journal, newsletter articles, seminars and eventually through our own schools."

"We also want to interact with the manufacturers. We have lots of problems in this area. We have problems with standardization, for example. Each equipment manufacturer sells its own device and its own methods, so it's very difficult to go from one piece of equipment to another or to cross-train people," he said.

"The majority of people who are becoming members are those that run key-to-disk installations, but as we grow we are going to encompass all current methods.

"I believe we will grow as a profession and maybe some day, instead of calling ourselves 'data entry management,' we might call ourselves 'data base management,' those in charge of the entire aspect of the data base."

Bodek, who has been in DP since 1961, said the formation of Dema was prompted by a group of professional friends who saw a need for this type of association.

The organization currently has over 110 members. Meetings are also scheduled Nov. 5 in Rye, N.Y., and Dec. 7 in Pasadena, Calif.

Membership is $45; the fee for a second member from the same facility is $25. Dema can be reached at 16E Weavers' Hill, Greenwich, Conn. 06830.

User Calls Upgrade to Criterion 'Ho Hum Affair'

(Continued from Page 31)

The peripheral card reader was necessary to replace a unit integrated into the console of the Century 201. The console of the Criterion is designed for independence from specific data input media, Lindee noted.

Lindee, Leonard Mendoza and Charles Crespi, two programmer/analysts, and Tyrone Dowdell, operations manager, attended a three-day orientation session at nearby El Segundo, Calif.

Then, to qualify feasibility of the new installation, Dart personnel took copies of actual disk files, running programs and input media to NCR's Rancho Bernardo facility for two weeks of staging. There they could run their usual programs on a Criterion, gain the hands-on experience necessary for conversion and also achieve the level necessary for a firm installation commitment, Lindee said.

There were some initial problems, he recalled. The prototype Criterion scheduled for use was undergoing modification. There was also a delay in putting together the exact configuration of disk and other peripheral units to match the Dart installation.

"Staging was scheduled to begin on a Tuesday morning," Lindee said. "However, we didn't gain access to the Criterion until Thursday morning. This delay had already put staging two days behind which, naturally, generated some concern on both sides about a prolonged staging situation.

"By early Thursday evening we had successfully completed running our freight bill, payroll and accounts receivable systems. This was in addition to running in a multiprogramming environment to satisfy our on-line and programming requirements.

Savings to Be Reinvested

The Criterion mainframe with 192K of main memory rents for approximately $1,000/mo less than its Century 201 counterpart, Lindee said. Following the established pattern for Dart, this savings will be quickly reinvested in upgraded capabilities, he noted.

Lindee looks forward to the day when the Dart system will be oriented heavily toward on-line applications. Printed reports will be replaced almost completely by systems of on-line reference, of which current applications have already saved an estimated $27,000 annually in paper costs alone.

Criterion Users Plan Many On-Line Jobs

(Continued from Page 31)

Medics programs, St. John said.

The NCR system was "easy to convert," he commented, adding the hospital really just took one system out and plugged the other in.

Southern Bank Card Corp.'s Criterion replaced a Century 300, according to John Bull, the firm's president. The company provides DP and marketing services to banks and merchants using BankAmericard, he said.

"We do a good bit of on-line processing here," Bull said, "and the Criterion was cost-competitive for its capabilities. Besides, it's the new product line, and the company likes to keep in the 'forefront.' "

The firm's configuration includes the 8550 with 256K of memory, three disk drives, a 160-column printer, high-speed magnetic tape and card reader.

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Negotiations — Part 3

Detailed Planning Can Maximize the Team's Position

By Joe Auer

Special to Computerworld

Given an adequate strategy for your negotiating team to employ during negotiations, the next step is to do the final detail planning of the negotiations themselves.

This includes the time and place where the negotiations will occur, the limits of authority that are or will be evidenced on both sides of the table and a detailed agenda for the negotiations. Some ground rules for the negotiations should be established and the team should rehearse.

The objective of these five areas is to maximize your negotiating team's position.

Careful consideration of the time and place is necessary for several reasons. The user's negotiating team should have the "home field advantage," timely access to all data required in the negotiations and an environment which is comfortable mentally and physically for the team members.

Limits of Authority

Next, determine the limits of authority that your lead negotiator and/or various members of your team will have. There are advantages in going to the negotiating table with the overt, announced authority to make a deal.

Conversely, there are advantages in going to the negotiating table with only limited authority, such as recommendation power for a higher authority on which to sign.

The planning of an agenda for the negotiations optimizes the participation of the negotiating team members, sets the stage for successful negotiations and shows you are well-prepared.

One approach is to structure your agenda so minor items are presented first and agreement by the vendor can be obtained easily. This sets the stage for agreement of larger and more important issues later.

Ground rules for the negotiating sessions are just as important for the individual participants. Setting the ground rules can be to your advantage.

For instance, in a preplanned work session to discuss the financial trade-offs between various acquisition methods, you can make sure no emotionalism with respect to maintenance problems comes into the fray.

In your negotiation rehearsals, pick out some particularly obnoxious, discerning, argumentative person or people from your company that have a general concept of your negotiations position paper. In fact, this may be one of the members of your team.

Have that person play the devil's advocate. Vendors do it all the time in "role-playing sessions" prior to sales calls, presentations, negotiations and the like; so, if you don't have effective rehearsals, you will be at a disadvantage during negotiations.

By this time you should be adequately prepared for the actual negotiations to ensue. Remember, when you are conducting negotiations with a computer vendor, that is the time to put in writing all of the implications, promises (statements like, "We don't need to write that down, you can trust me"), proposals and benchmark results.

This article, the last of three in a series about optimizing computer negotiations, deals with maximizing the team's position.

Make sure all the reasons you wanted the computer in the first place are included in the written document your company will be executing.

You can accomplish this in such a way that you don't jeopardize your day-to-day working relationship with your vendor. Treat it like a normal business transaction and make sure both sides have a clear understanding of the relationship.

Make sure it is documented so a third party could pick up the completed agreement and understand the actual deal.

Don't Rush

There is no reason to rush the negotiations. You may actually have a real urgency on your part to complete the negotiations, but keep in mind you may only have a sense of urgency that has been created for you by the vendor. In any event, remember to negotiate at your speed, not theirs.

Don't dump your whole shopping list on the vendor at the first negotiating session, if there are going to be multiple negotiating sessions (or at the first of a single negotiating session).

Auer is president of International Computer Negotiations, Inc. in Winter Park, Fla.

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On-Line System Solves Manufacturers's Parts Problem

OKLAHOMA CITY, Okla. – Manufacturers that build complex products with many features and options face a common problem: they must decide if a particular product can be built as ordered and, if so, what parts will be required, according to a spokesman for a local company which dealt with this problem.

At Fife Corp., a major producer of guiding, scanning and gauging systems for materials produced in roll form here, this complicated configuration/decision-making process is now handled as part of order entry – in just three minutes via a computer terminal, the spokesman indicated.

Yet every Fife order involves a unique, highly-customized product which can range in cost from $1,000 to $150,000 and includes a total of several hundred parts. These are selected from, for example, some 40,000 possible combinations for the power unit alone, he explained.

During the new procedure, a production planner enters the order using the terminal's light pen. He completely configures it during an interactive conversation, involving from one to two dozen questions and answers, with Fife's IBM 370/115.

On-line editing procedures guard against the selection of misfits and "illegal" combinations. No matter how complex the end product, there are only four opportunities for planner error and the system gives warning at these points, he noted.

When the configuration is complete, an IBM Model 3277 terminal displays all parts selected down to the zero-level bill of material. The planner can check these critical parts and inquire into the inventory status of any items that he thinks might present problems, he explained.

Replaced Manual Configuration

This automated system replaced manual configuring with preprinted forms which took 30 to 45 minutes. But the saving in configuring time itself is small compared to the savings in time at many levels which result in the high accuracy and complete consistency of the new system, the spokesman commented.

Manual configuration was not always accurate, he stated. Also, virtually every department had its own bill of materials – including engineering, manufacturing, finance, marketing and the man on the shop floor.

These were not always updated and, consequently, not always in agreement. As a result, hours were wasted on the shop floor, he said.

In some cases, if the necessary part was not specified on the accounting bill of materials, the completed item went out without the part being priced, affecting Fife's margin, he added.

With the terminals, everyone uses the same bill of materials stored in the system. Thus, everyone is working from the same, current, accurate information, the spokesman noted. Because each order is also stored in the computer as soon as it's configured, the system not only gets customer orders into production faster, but they can be tracked more closely and easily.

This permits Fife personnel to respond most effectively to customer inquiries. Fife can tell by a terminal inquiry if an order is in marketing, engineering, production control or on the shop floor, he added.

Parameters Aid Schedulers

From the order-entry configuration information, the 370/115 schedules production with the aid of parameters such as due dates, priorities and lead times provided by production control personnel. On a release date basis, the computer prints a hard copy of the assembly order and the picking order, according to the spokesman.

The picking order is displayed and processed on the terminal in the inventory area.

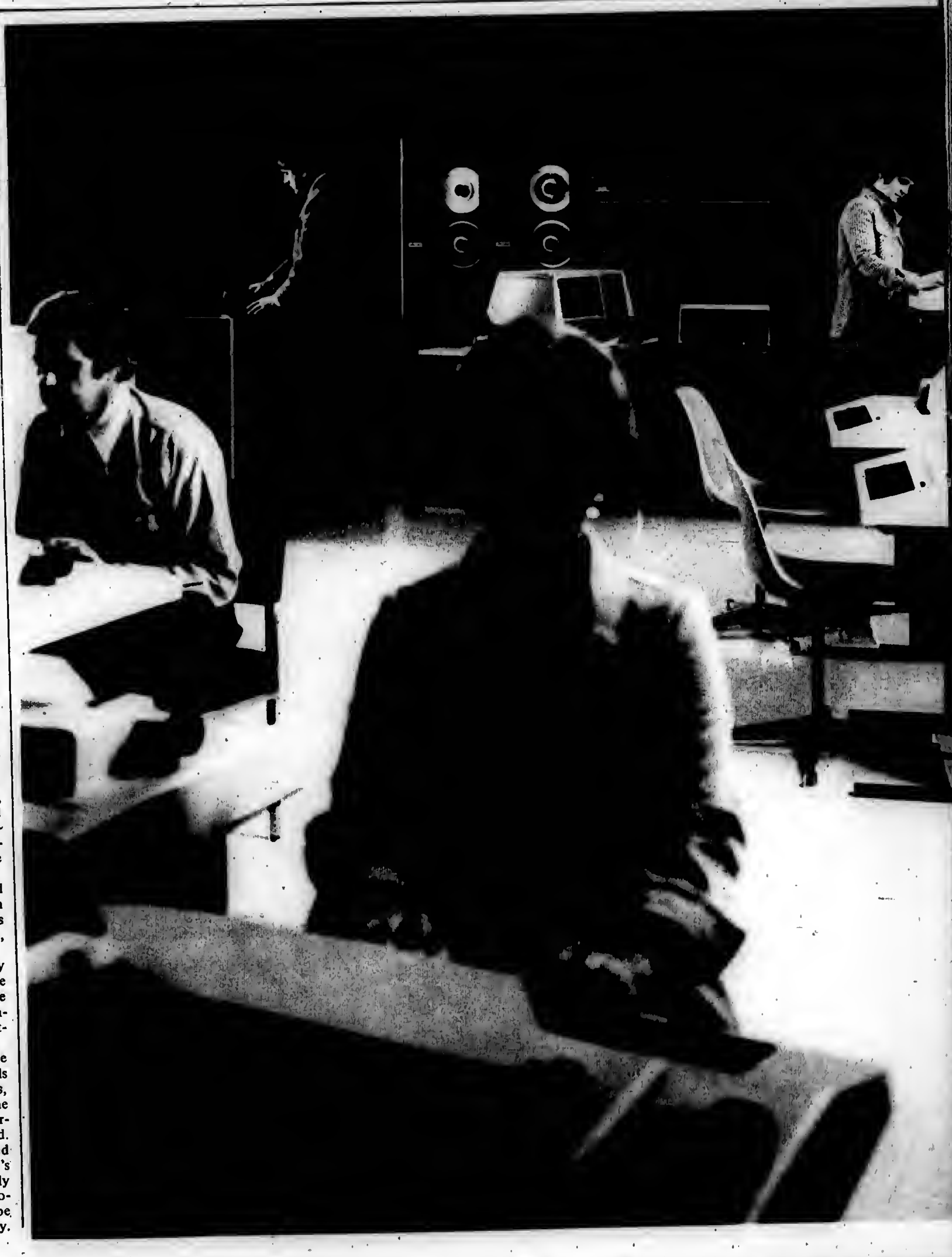
Before the system became operational, Marshall W. Simpson, supervisor of inventory control, said he thought Fife would have to run the manual system parallel to the computer for about a year. But at the end of the first week he was ready to drop the older system.

"In the past, accurate configuration depended on experienced, key people," Donald D. Paulsen, executive vice-president, said.

"Crisis management became our standard form of operation and production efficiency inevitably dropped. Now, we anticipate a 20% increase in production efficiency as we eliminate 'hot lists,' priority expediting and similar fire-fighting techniques," he added.

Fife also expects a reduction of 15% to 20% in total inventory value as a result of the improved inventory management and control, plus a substantial decrease in instances of out-of-stock parts, Paulsen said.

Fife plans to use the configurator as a simulation tool. This will allow personnel to ask the computer "What if we sold X number of product Y . . .?" and the system will answer what the effect would be on inventory, manpower planning, production, scheduling, financial requirements and the like, he explained.



Saves Taxpayers $70,000/Year

State Using System to Herd Off Livestock Epidemics

HARRISBURG, Pa. – The Agriculture Department here has developed a computerized system to keep track of disease outbreaks in livestock herds in order to stop them before they become epidemics.

Believed to be a unique state government service, the system is expected to reduce losses suffered by farmers from animal diseases as well as save taxpayers up to $70,000 annually in recordkeeping costs.

According to Raymond J. Kerstetter, Pennsylvania secretary of agriculture, the commonwealth will be able to keep closer track of livestock herds to pinpoint possible problems and forestall potential epidemics.

Information on the commonwealth's 50,000 herds totaling nearly two million cattle is stored in a Univac 1110 system in the state DP center in nearby Middletown. The center operates under the direction of James N. Wade, secretary of administration.

The data includes records of infectious diseases as well as information on 900 accredited veterinarians.

Linked to Terminals

The computer is linked to Uniscope 100 terminals located in eight regional offices of the Agriculture Department and its headquarters here. The regional offices are in Meadville, Williamsport, Tunkhannock, Gibsonia, Altoona, Summerdale, Lansdale and Lancaster.

Personnel in the district offices can type questions into the display terminal to inquire about a herd, specific animals, the herd owner or the veterinarian associated with the herd.

The requested data is displayed on the screen of the terminals and, if desired, a hard-copy version of any messages appearing on the screen can be obtained from an associated printer unit.

Assists Herd Owners

The data permits regional department personnel to assist herd owners in acquiring health certificates needed for the sale or showing of their animals. It also allows for the dissemination to herd owners of up-to-the-minute findings of all brucellosis and tuberculosis animal testing.

The system replaced manual file keeping, resulting in an annual saving of $70,000, the state claimed.

The system was devised and implemented by the Bureau of Administrative Services' Division of Management Systems. Dr. Everett E. Denlinger, director of the Bureau of Animal Industry, provided the technical logic for the system, assisted by Dr. John Dick, head of the bureau's Brucellosis and Tuberculosis Division.

Portfolio Probes Considerations In Centralization

PENNSAUKEN, N.J. – Economy of scale is the reason most frequently given for the centralization of operations while effectiveness is most often cited as the reason for decentralization, according to a portfolio, "Centralization: 'To Be or Not to Be'," in the Auerbach Data Processing Management Information series.

On one hand, decentralized systems may have unused capacity; on the other hand, they could be overloaded, generating pressure to upgrade equipment or purchase expensive service bureau time, the article stated.

But "a single-purpose mini, programmed for a specific application, is extremely inexpensive," Auerbach noted.

"Furthermore, if it is used as an office machine, it does not require the operator or programming and technical support of a general-purpose computer.

Change is Traumatic

"Change is traumatic," Auerbach warned, "and the average organization is well-advised to avoid it unless it is well-justified. For this reason, a DP manager should look carefully into the question of organizational change before acting.

"In fact, one key question should be raised before any detailed analysis is performed: Why is the centralization vs. decentralization issue being raised at all?" Auerbach said.

"If the answer is that the issue is politically motivated (and it frequently is), the manager should attempt to resolve [it] by means other than organizational change," according to the article.

The portfolio is available from Auerbach Publishers, Inc., 6560 N. Park Drive, Pennsauken, N.J. 08109.

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After Five Years of Deciding

Firm's Mini Eases Cash Flow Problem

By Esther Surden
Of the CW Staff

PHILADELPHIA – It took five years for Rittenhouse Book Distributors, Inc. to purchase its minicomputer, but when the selection process was finally over, Treasurer Daniel Foster could program the system himself.

The company was running into a cash flow problem, Foster noted. With an open invoice file of almost 12,500, a customer master file close to 2,000 and more than 300 invoices to prepare each day, the firm realized the need to computerize.

First came the inevitable brush with time-sharing, Foster said. With the system, accounts receivable and bills were caught up, but each bill had to be fed into the system manually and the invoices had to be individually typed.

So, the investigation of the small-business system area began, he reported.

"I saw everything from Datapoint [Corp.] to a Japanese outfit and considered NCR, IBM, Basic/Four [Corp.], you name it. We subscribed to Datapro and went down the line, contacting all the manufacturers in the $40,000 to $80,000 price range.

"I'd call up the salesmen who'd come out for a primary talk. If that seemed okay, we'd go to their office to see the 'pony show.' After that, I'd visit installations," Foster said.

Finally, the company decided on a Microdata Corp. Reality system because the dealer, "Keystone Data Systems, wanted to adapt the computer to my business instead of wanting me to adapt my business to the system," he reported.

The dealer also encouraged Foster to learn to program himself. "I went to a few classes and before I knew it I was programming a few simple programs," Foster stated.

The Reality System was delivered in September 1975. It presently has 32K of core, 10M bytes of disk, three CRTs, two plotters and a 200-char./sec line printer.

The company has 8K of core on order to accommodate a court CRT which is also on order, he noted. The system cost $39,750, he added.

The company, a book outlet for medical and nursing books, does "more or less the standard accounting functions" with the system, Foster indicated.

Foster wrote all of the programs himself and had a hand in the program development aspect. "I'd hate to think how long it would have taken to have to explain the book business to a DP specialist," he said.

Programs were written in Data/Basic, he added.

In addition to accounts receivable and invoicing the system handles post invoicing, purchase orders, a mailing list, daily sales report, employee pension plan and order entry.

Foster has also developed a check writing program which is a time saver, he said. The system is now saving five hours of the president's time per week in preparing reports on consignment accounts, Foster noted.

Rittenhouse had previously been able to get out only 120 invoices per day with an accounting machine, but the Reality system produces some 320 per day and before 4:00 p.m.

Getting books out faster has also improved sales, Foster reported. "We spend 90% of our time on 10% of our sales. Reality has made considerable inroads into that 90%," he noted.

One of the specialized applications involves the special order file, he said. This file keeps a record and creates an invoice with everything on it except the price for orders that have to be customized.

When the book comes in, the customer service people can search through the particular file and find the book, he explained.

SM Adds Add-On

NEWPORT BEACH, Calif. – Standard Memories (SM) is the latest to announce an add-on or replacement memory for the Digital Equipment Corp. PDP-11/70 with the introduction of the Ecom 70.

The unit, packaged in a 12-1/4 inch rack-mounted chassis assembly which can contain up to 16 memory modules and a control card, can hold up to 512K bytes in 64K-byte increments, the firm said. Read/write cycle time is 800 nsec, it added.

A remote programming box (RPB) that fits under the enclosure chassis is included in the Ecom70.

The RPB contains reconfiguration controls to allow users to select the address range of the Ecom 70 and a downgrade switch to allow users to disconnect non-DEC memory without hardware modifications, power controls and fans, the firm said.

The Ecom 70 64K-byte memory system, including the RPB costs $7,100. A 64K-byte expansion kit costs $4,400, the firm said from 4120 Birch St., Suite 105, Newport Beach, Calif. 92660.

Wang CPU Features Faster Throughput

TEWKSBURY, Mass. – Wang Laboratories has enhanced its System 2200 with another CPU offering faster throughput, larger user memory and extended Basic language capabilities, the firm said.

The firm also introduced a portable matrix printer for all Wang systems.

The 2200VP is designed for heavy disk-based applications by commercial users requiring enhanced file manipulation techniques, the firm said.

Other users with intensive scientific and number crunching applications can also use the CPU, a spokesman noted.

The 2200VP provides up to 64K bytes of memory with parity. Memory is available in 16K modules, the firm noted.

'Less Time Consuming'

The extended Basic-2 language is said to make writing, documenting and debugging programs less time-consuming.

Improvements have been made to the mathematics and matrix instruction sets, data manipulation techniques and error handling features, the company added.

The microprocessor-based CPU features a 500-nsec random-access memory (RAM) used for both user memory and the instruction set.

Previously, the instruction set had been hardwired in read-only memory, Wang noted. Now, the cycle time for most instructions is 600 nsec compared with the former 1.6 μsec, the firm added.

The 2200VP can use all peripherals formerly in use with the System 2200 except for tape cassette drives and a hand-fed mark sense card reader, the firm noted.

Software-Compatible

It is software-compatible with the previous processor, the company said.

The matrix printer, Model 2251, prints a 40-column character line at 110 char./sec on a 3.75-in. 200-ft paper roll.

The 96-char. alphanumeric type can print in either blue or red ink by selecting either color or programming in color changes, the firm noted.

Lists Programs Loaded

A list/print control allows the user to list programs loaded into the CPU, it added.

The printer costs $1,100. The 2200VP with 16K of memory and nine I/O slots costs $13,000 and maintenance is $75/mo, the firm indicated.

Additional 16K memory modules cost $3,200 each and maintenance is $32/mo.

Rental and leasing plans are available, Wang said from 836 North St., Tewksbury, Mass. 01876.

DEC Announces Disk Drives for PDP-8, PDP-11

MAYNARD, Mass. – Digital Equipment Corp. (DEC) has announced four disk drives for its minicomputers and mainframes.

The RP05 and RP06 disk pack drives are designed for use with the PDP-11, Decsystem-10 and Decsystem-20 systems. The RK05F nonremovable double-density disk operates with the PDP-8 and PDP-11 minis while the RK06 can be used with all of the Unibus-based PDP-11 systems, DEC said.

Field Upgradable

The RP05 disk drive uses the same disk packs as used on the RP04 disk system, a spokesman said. It can be field upgraded to the RP06 through use of a kit.

The RP06 has a formatted storage capacity of 176M bytes for PDP-11 minis and 197M 7-bit Ascii characters for use with the Decsystem-10 or Decsystem-20. It has double the track density of the RP04, the firm said.

Double-Density Version

The RK05F is a double-density version of the RK05 disk pack with a capacity of 5M bytes on the PDP-11 or 6M bytes for the PDP-8, DEC said.

The RK06 accepts a dual-disk cartridge with a 14M-byte storage capacity, the company indicated. It is a top-loading unit featuring a track-following servo system with one of the four disk surfaces dedicated to servo control and tracking information, DEC said.

Up to eight RK06 drives will operate from a single controller, the firm added.

Systems running RT-11, RSX-11D, 11M, IAS, RSTS/E and Mumps operating systems can handle the RK06 drive, DEC said. The RP05 and RP06 are supported by RSX-11D, 11M, RSTS/E, IAS, Mumps, Tops-10 and Tops-20, it added.

The RP05 costs $29,900; the RP06 costs $34,900. Both will be available the last part of 1976, DEC confirmed.

The kit to upgrade the RP05 to the RP06 costs $10,000, it noted.

The RK06 costs $9,500, the RK05F costs $6,500 and both will be available in 1977, DEC said from Maynard, Mass. 01754.

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User Can Be Loser When Buying System From Dealer

By Michael Dunlop
Special to Computerworld

Minicomputer Exchange

With the specter of many unhappy minicomputer installations beginning to emerge, a buyer should exercise extreme caution before entering into a contract to purchase a minicomputer from a dealer by making sure the dealer is financially sound and has a good local reputation for completing the job.

Together with the arrival of the latest generation of computers, the minicomputer, comes the minicomputer dealership.

On the surface, this dealership, whose purpose is to sell and supply programming and installation help locally for a particular manufacturer, seems to provide a very reasonable way for the manufacturer to market his products. But this marketing method may cause problems for the potential minicomputer purchaser.

Dealerships burgeoned when small mini makers faced severe financial problems during the recent recession. The vendors needed a rapid injection of cash together with increased sales and a reduction in accounts receivable, an area which has been a perennial problem in the computer business because of the difficulty of defining completion of a system and, hence, receiving payments.

To help alleviate this problem, some manufacturers decided a dealership program, regionally and nationally, would help solve short-term financial problems.

To set up a dealership, the mini maker must persuade a group of people or sometimes a small service bureau to buy a minicomputer cash-on-delivery (COD) or make a cash advancement and pay for subsequent orders with either COD or 30 days net as terms.

Noncompliance with these terms results in the loss of the dealership.

This action immediately generates sales for the manufacturer, improves his cash position and passes the receivables problem onto the dealer, who is sometimes ill-equipped to cope with it.

Pyramid Selling

Some manufacturers employed salesmen to go out and sell dealerships by promising the dealer substantial return on his investment and easy entry into the lucrative and expanding minicomputer market.

Other mini makers offered large areas to the dealers, encouraging them to set up subdealerships.

These two strategies have started – perhaps not intentionally – a dangerous pyramid structure in which the potential purchaser of a minicomputer system can be the loser.

There are over 70 different minicomputer companies in the U.S. Although many are supported by reputable distributorship networks, some are taking on the guise of pyramid selling operations.

Financial Stability

Another problem area confronting the minicomputer dealer is financing.

Many of these operations are set up on capitalization of less than $100,000. If an installation is unsatisfactory, then the buyer will not pay the dealer. The dealer has no alternative but to pay the manufacturer, however, so he is left with financing the computer.

If two unsatisfactory installations occur at the same time, a dealer could tie up between $60,000 and $80,000. If he also lost $20,000 on a fixed-bid software contract, which is not unusual, it would not take a financial genius to predict the dealer's potential demise.

To prevent this problem, the dealer's terms with the purchaser have to be strict: payment for the computer on delivery, which frequently occurs before the computer programs have been completed.

By paying for the system before the programs are complete, the user has lost his best weapon against the dealer to ensure the satisfactory completion of programming.

Dunlop is president of Computer Information Center, Inc., a firm of consultants based in Bellevue, Wash.

Diversified Introduces First Unit in Family With Interdata CPU

TUCSON, Ariz. – Diversified Data Systems, Inc. has designed a family of small business systems based on the Interdata 6/16 for first-time users.

The first member of the Ibols 160 family introduced was the 166, which includes the CPU with 64K bytes of core, CRT console, 10M bytes of disk and a 300 line/min printer.

Software for the system includes the Interdata operating system OS.6/MT2 and Diversified's Ibols/16-II-Oasis software package which includes Cobol, a file management system, sort/merge utility and an Ebcdic/Ascii translation utility.

In addition, an integrated business accounting system is included with the package. It includes processing modules for accounts receivables, payables, payroll, invoicing, inventory control, fixed-asset accounting and general ledger, the firm said.

Users can modify the horizontal and vertical format of most of the standard reports without changing the programs, Diversified said.

The unit can optionally emulate the IBM 2780; users can obtain RPG-II as well, the company added.

The basic system costs $49,500 with delivery beginning Jan. 1, the firm said from 2601 N. Fairview Ave., Tucson, Ariz. 85705.

Printer From Decision Data Replacement for IBM 1403

HORSHAM, Pa. – Decision Data Computer Corp. has a 900 line/min printer for the IBM 3/8, 3/10, 3/12 and 3/15.

The Model 6609 is a direct replacement for the IBM 1403, Decision Data said. The printer operates under standard system software and requires no changes to user programs, a spokesman added.

The system accommodates forms with up to six parts, he said.

Monthly rental prices for the 6609 range from $670 to $825 depending on the contract term selected; the purchase price is $24,450, Decision Data said from 100 Witmer Road, Horsham Pa. 19044.

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- 10:45-12:00 – Panel – The Data Base Future: DBTG, relational, distributed or?
- 12:00-1:30 – Luncheon/Speaker: Leo J. Cohen: The Impact of Data Base on Management's Business.
- 1:30-4:00 – Four Concurrent Sessions

SESSION 1
Review of the Packages;
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SESSION 2
Service Analysis;
Data Base System Requirements Definition

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SESSION 4
Distributed Systems;
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For Certain Dedicated Applications

Microcomputers Cited as Outpacing Minicomputers

By Esther Surden
Of the CW Staff

MONTREAL – Microcomputers can outpace minicomputers for certain dedicated applications, according to speakers at the recent Canadian Computer Show and Conference here.

A dedicated on-line supervisory monitoring system at David Florida Laboratory in Ottawa displays the status of the Communications Technology Satellite (TCS) altitude display system, according to W.F. Croskery, manager.

The display uses IMP-16 microprocessor components as well as a special interface to "decommutate the spacecraft telemetry data and drive a flowchart display that indicates the status of the control system," Croskery told the attendees.

The company chose microcomputers because "we wanted stand-alone smart machines; we didn't really want a complex system," Croskery noted. What developed was more sophisticated than the company envisioned, he said.

The display was needed so engineers could look at one panel and determine the system's status rather than to look at six different displays, Croskery explained.

Expensive Effort

The development effort was expensive, Croskery admitted. "For one system it isn't efficient to use a microcomputer, but if you are designing more than one, as we intend to, it becomes cheaper than implementing it on a minicomputer."

Microcomputers have the additional advantage of being less complex and therefore more reliable than minicomputers, Croskery said.

The company began building the system in April and development of the operating system took about six man-months, he added.

M.S. Gold of Bell Northern Research in Ottawa told the group about a Processor Information Exchange System known as Pies.

The system uses multiple microprocessors which function as message switchers to provide data communications between a number of control processor complexes in a switching system, Gold said.

Increased Capacity

The use of micros has allowed Bell to realize an increase in system capacity and to lower system cost, he noted.

The problem solved by the micros involves the replacement of electromechanical equipment.

As many as 800 of the electromechanical transmitters and receivers could be located in a medium-scale office, he noted, adding when switching systems are close together, it becomes very expensive.

Requirements of the Pies system included high reliability and duplicate micros are used for the necessary redundancy. In some applications as many as three can be used to handle greater traffic, he indicated.

In the system, the micros are identical and operate independently of each other, Gold stated. The units operate synchronously and are accessed as though they were I/O units. The I/O bus between the micros and the processor can be accessed by either of the micros, he added.

In the Pies system, each microprocessor is tied to the I/O bus and, thus, functions as a microcomputer, Gold continued. "This could be interpreted as a move toward distributed processing although our original intent was not to do so."

The internal message contains three control words. The first word contains two progress markers, the second is a checksum over the remaining ten words.

The remaining is distinctive code, he noted. The micro ignores any message that doesn't agree with the checksum, he said.

The system provides more real-time power than the firm needed, but shared memory wouldn't have been adequate since the applications required reliability and thus isolation, he explained. "We could not tolerate a loss of sanity to pull down the entire station," Gold said.

CW Photo by E. Surden

M. S. Gold

Icom Has Floppy Subsystem For OEM, Hobbyist Micros

CANOGA PARK, Calif. – A high-performance floppy disk subsystem designed for OEM or hobbyist microprocessor-based systems has been introduced by Icom, Inc.

Model FF-36, dubbed the Frugal Floppy, employs the same elements as the firm's FD360 system, according to a spokesman.

The FF-36 contains a controller/formatter, a floppy disk drive with daisy-chain capability and all required connectors and cables. The unit can be supplied as a single or dual drive system, he indicated.

Icom's FDOS-II software package was designed for any Intel Corp. 8080 or Motorola Semiconductor Products, Inc. 6800-based system, the spokesman stated.

The FDSO-II software features named variable length files, auto file create and open and close and multiple merge and delete, he added.

FF-36-I is priced at $995 in small OEM quantities or $1,195 for a single unit. Icom is at 6741 Variel Ave., Canoga Park, Calif. 91303.

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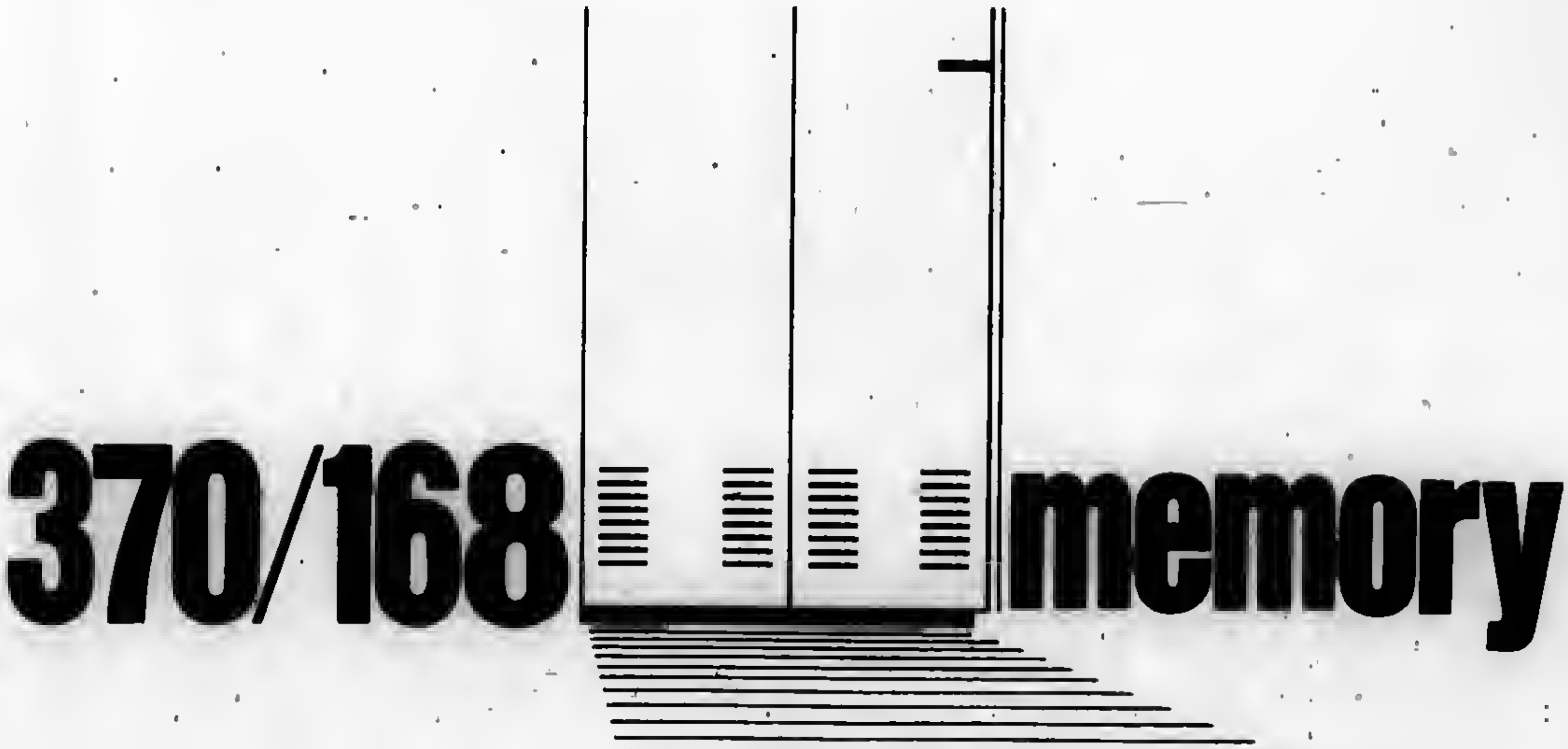

Distributed System Helps Scientists With Satellite Data

OTTAWA – Canadian geophysicists are using minicomputers to collect data to help measure the nature of such phenomena as the slight wobble of the earth and the minute changes in its rotational speed.

The data mainly consists of precise locational fixes made on navigational satellites, but it is also used in polar motion studies being conducted by the Earth Physics Branch of the Canadian Department of Energy, Mines and Resources.

The data is transmitted to the U.S. Satellite Control Center (SCC) at Johns Hopkina University in Maryland where, combined with similar data collected from 22 other points around the globe, calculations are made to improve the accuracy of the U.S. Navy's Navigational Satellite System.

Currently, two Canadian stations 2,600 miles apart are actively collecting the data. One of the stations is here and the other is at Calgary, Alta. Each uses a Hewlett-Packard Co. (HP) 9600 data acquisition and processing system; the two are arranged as a distributed aystem.

The network, used primarily for data acquisition and identification, also performs data validity tests to determine if system malfunctions occurred and distorted the data. The systems are also used for data communications and a data transmission log is maintained.

Each mini receives the data over hard wires from an associated satellite tracking station which is part of the U.S. government's worldwide Tranet satellite tracking network. Tranet is used for acquiring and compiling fixes on the Navy's navigational satellites.

The behavior of the satellites during thousands of orbits has confirmed many modern conclusions regarding the shape and physical makeup of the planet, according to Dr. Josef Popelar, a geophysicist.

For example, the earth's center of gravity has been proven to be offset from the geometric center; the earth is not actually a globe, but slightly flattened at the poles and pear-shaped, depending on the viewing angle.

The more orbital observations made, the more can be learned about the planet and the more accurate will be the mathematical models of the earth's behavior, Popelar said.

Study Gravity Field

Also being studied with the Tranet system are the gravity field of the earth and other force factors, such as solar radiation pressure and atmospheric drag, which affect the motion of satellites over the long term.

By improving the understanding of the earth'a motions and gravitational field, the accuracy of satellite, interplanetary probe and missile launchings are improved, Popelar said.

"We contribute our tracking data along with the other stations once or twice daily. SCC conveys this data to a large computer where it is used in a sophisticated force model to recalculate the satellite's orbit with greater accuracy," Popelar said.

The data being collected by the Tranet tracking stations, such as those at Calgary and Ottawa, consists of preciae information on frequencies of received satellite radio signals with respect to an accurate time reference.

Because of the relative motion between the satellite and the tracking station, the frequency of the transmitted signals is altered and this so-called Doppler ahift is directly related to the relative velocities and locations of the tracking station and the satellite.

Data Transmitted

The parameters acquired and transmitted to SCC vary for each station. Typically they consist of station identification, day number, year, satellite number, hour/min/sec/msec of tracking instant, Doppler count, refraction count, temperature, pressure, humidity and format codes.

Each data message must contain information required by the communication protocol such as priority, message routine indicator, originator and time.

Data collected at Calgary is transmitted over a dedicated line at 300 bit/sec to the central computer station here.

Data from both stations is temporarily stored at Ottawa on the system disk using the HP RTE file manager software package. Once or twice a day, the HP mini scans the appropriate data files, identifies individual satellite passes and selects "good" passes for permanent storage.

The Canadian researchers here are concerned primarily with polar motion studies using two independent techniques which are constantly being compared.

Photographic zenith tubes are used at Calgary and Ottawa for precise astronomical positioning. These are essentially vertically mounted telescopes used to photographically record transits of stars close to the zenith. This information is used for astronomical determination of polar motion and the earth's rate of rotation, Popelar explained.

Polar motion represents the changes in the orientation of the axis of rotation of the earth with respect to the earth's figure. As the axis of figure is defined by the axis of rotation at a given epoch and can be identified with the geographic poles, the polar motion results in a significant variation of the instantaneous pole of rotation with respect to the geographic pole, describing approximately a circular path every 14 months.

This wobble must be continuously monitored with great accuracy to maintain a highly stable reference system, Popelar noted.

The distributed minicomputer system consists of a 32K HP 2100 central computer operating under multiprogramming real-time executive with file manager, paper tape reader, 5M-byte cartridge disk drive, 30 char./sec console printer and card reader.

The distributed system package provides on-line communications between the terminal and central computers and gives the terminal full access to all the resources of the central system, such as data storage and file manipulation on the central disk, program scheduling on the central computer and terminal program development and storage.

The terminal system consista of a 16K HP 2100 minicomputer, paper tape reader, console printer and card reader. It operates under a terminal communication executive as an I/O device with its own programming capability.

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Lawyers' Payments in Question

Telex vs. IBM Generates Glut of Suits, Countersuits

By Edith Holmes
And Molly Upton
Of the CW Staff

TULSA, Okla. – Numerous lawsuits are amassing in the wake of the Telex vs. IBM suit settled out of court one year ago.

Most of these pertain to payment of lawyers' fees by Telex: However, IBM has entered the act by filing an action just in case it is told by the Tulsa court it must share in some of these payments by Telex.

In the case of Walker vs. Telex and IBM, Telex's former attorney Floyd Walker has filed for payment of $1.5 million he claims Telex owes him for services rendered under his employment contract.

Telex's counterclaim against Walker, filed Sept. 17, seeks $938,676.76.

In IBM vs. Telex Corp. and Roger M. Wheeler, IBM is seeking to indemnify itself against participating in payment of Telex's legal fees.

This trilogy of suits was filed in the District Court of Tulsa County.

Another former Telex attorney, Moses Lasky of San Francisco, who represented Telex in its appeal to the Supreme Court, has filed suit against Telex seeking $1 million in payment. The suit was filed in the U.S. District Court of San Francisco.

And a former Telex employee, Harry Ashbridge, intended to file suit last week in the District Court for Hennepin County, Minn., claiming Telex owes him $25,000 for his services to the company as a paralegal during Telex vs. IBM.

In Walker's suit against Telex, filed last year, the Tulsa court established that both Telex and IBM will be held liable for any attorneys' fees the court decides are owed.

At issue, Walker said, is what will be the basis for his payment; whether that will be the amount of the counterclaim judgment.

In the settlement of Telex vs. IBM, which was made without Walker's consent, IBM's counterclaim judgment against Telex, amounting to $22 million, was waived in return for Telex's dismissal of antitrust charges.

Telex was indebted to IBM for this amount, he said, which was discharged. "I was to be paid according to what Telex received, including any settlement it made, whether for money or in lieu of money," Walker remarked.

A Telex spokesman indicated the firm's position is that Walker is not entitled to anything since he didn't give the firm anything. He declined to comment further.

Before any judgment was rendered in the Telex vs. IBM case, Walker had notified both Telex and IBM that he was claiming an attorney's lien as security for payment of any fee that might be due him, Walker said.

By so doing, under Oklahoma's attorney's lien statute, both parties may be held liable for payment, he said.

The next step in this case is a hearing scheduled early this month on the amount due him, Walker said.

Meanwhile, IBM has filed suit against Telex and its Chairman of the Board, Roger M. Wheeler, in the state district court in Tulsa as well.

IBM claims, as part of the settlement of Telex vs. IBM, Telex agreed to compensate IBM for any loss or expense incurred by the antitrust suit, including reasonable attorney's fees. Wheeler, in his position at Telex, personally guaranteed this indemnity, IBM's papers said.

Telex and Wheeler now claim IBM has breached this agreement and Wheeler's

(Continued on Page 46)

Adapso Analysts Told

Services Industry to Reach $7.9 Billion in '78

NEW YORK – The compound growth rate of revenues for the computer services industry will accelerate from 16% to 20% over the next three years, 1976 through 1978, Richard J. Murphy told the Association of Data Processing Service Organizations' analysts here last week.

This growth will mean an increase in revenues from $4.6 billion in 1975 to $7.9 billion in 1978, he said.

Murphy, director of research and development at International Data Corp. (IDC), outlined five reasons for the accelerated growth rate.

- A high percentage of the EDP market has matured to a stage of cost consciousness in their process of selecting and evaluating alternatives, an objectivity which often spills over to the consideration of the make or buy options on independent information systems or applications.
- Leaders in the services industry have adopted business strategies to provide specific information systems for target market segments that are proving more productive and economical than self-developed systems.
- Vendor supplied software packages are also passing the test of economy and productivity and will become more popular.
- The three-year 1976-1978 period is expected to be the latter half of a relatively stable period of hardware systems.
- A combination of forces, including the above, appears to be carrying the EDP market into the age of distributed processing, in which a hierarchical or pluraiistic system will become more popular. This change will provide a more open market for the service industry to compete in.

The computer services industry certainly does not have a small and homogeneous membership and the fortunes of the majority of its members will experience severe competition and economic stress during the next few years, Murphy stated.

See related story on Page 47.

This competition will be in the form of advancing hardware technology at lower cost as marketed by the mainframe and minicomputer hardware manufacturer.

In the near term, the competitive thrust is being focused on the market made up of small businesses, many of whom will be switching from data center services to their own computer.

In the longer term, this same hardware trend of the use of microprocessors is expected to increase the ability of the hardware systems manufacturers to compete against the processing service vendors in specific and narrow market segments, he stated.

This means that as the user moves toward the implementation of distributed systems, he will be offering an opportunity to the computer service vendors as well as the hardware vendors, he said.

(Continued on Page 45)

PDP-11/70 Add-On Opportunities Prompt Independents' Efforts

By Toni Wiseman
Of the CW Staff

With the burgeoning proliferation of Digital Equipment Corp. (DEC) PDP-11/70s – more than 600 systems are already installed – some memory makers are showing a distinct interest in the possibilities of this new add-on marketing area.

At least one however, after close examination, has decided not to compete.

Standard Memories got into the 11/70 add-on area because it sees a potentially large market since the PDP-11/70 is a more powerful machine in the 11 Series, according to Dan Ray, marketing manager.

"And if everything we've heard holds true, there will be a heck of a lot of them out there, if they maintain the popularity the other machines [in the 11 series] have maintained."

Standard is offering memory in 64K byte increments up to 512K bytes, which can be used in multiple chassis up to the total capacity of the machine, he said.

The add-on product will enhance Standard's current 11 Series add-on line since the module on the 11/70 will be interchangeable with a new 11 add-on the firm is planning to announce which will be in 16K word increments.

While Ray had no firm data on the growth of the market, he said 11/70 add-on is currently about 10% of total sales. He predicted the market would grow but could not estimate how much,

(Continued on Page 47)

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Led by Jack Stone, PhD, this two-day seminar will help you improve the usefulness and productivity of your computer operations by increasing your ability to communicate with people — from keypunch operators to the board of directors. Utilizing workshops, case studies and round table discussions, major topics covered include: Challenges and pitfalls of EDP people problems; principles of industrial relations in industry; managing analysts, programmers and operators; managing DP managers and supervisors; computer center end user and top executive relations; and the training, education and development of EDP personnel.

Cost for the seminar, including continental breakfasts and luncheons and all course materials is $300 for the first registrant, and $260 for additional registrants from the same company.

NEW YORK ... **Hilton** ... *Nov. 8-9*

Legal Tools For Computer Contracting and Protection

Led by Roy N. Freed, the internationally known lawyer, author and educator in the field of computer law, this 2½-day seminar will show you how to protect your interests when dealing with vendors that supply your installation. The seminar covers all types of contracts impacting computer use — including your own contracts. Other subject areas include negotiations, warranties, avoidance and resolution of disputes, security, fraud, taxation, and techniques for handling any transaction.

Cost for the seminar, including continental breakfasts, luncheons, and all course materials is $325 for the first registrant; and $275 for additional registrants from the same company.

NEW YORK ... **Plaza Hotel** .... *Oct. 27-29*
CHICAGO ..... **Hyatt Regency O'Hare** ... *Nov. 3-5*

Performance Evaluation and Improvement

Led by Saul Stimler, author of *Data Processing Systems: Their performance, evaluation, measurement and improvement*, this two-day seminar will give you performance measurement techniques that are *designed* to save your installation money. As well as system performance at your own installation, topics covered include: criteria for quantifying performance, pencil and paper analysis of a system, benchmarking techniques, realtime, batch, and interactive time sharing systems.

Cost for the seminar, including continental breakfasts and luncheons and all course materials is $250.

NEW YORK ... **Hilton** ..... *Nov. 8-9*
CHICAGO .... **Marriott** ... *Nov. 15-16*

Data Communications Course #1010 — Practical Data Communications Systems & Concepts

Led by Dr. Dixon Doll, the nationally recognized teleprocessing consultant, this two-day seminar will familiarize you with the latest advances in data communications, with emphasis on ways to cut costs. The course covers areas like SDLC, HiD-LoD, DDS, newly approved major revisions to WATS, and the impact of satellite carriers.

Cost for the seminar, including workbook, reference materials, luncheons and continental breakfasts is $350 for the first registrant, and $300 for additional registrants from the same company.

DENVER ... **Brown Palace** .... *Oct. 18-19*
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Also led by Dr. Dixon Doll, this three day seminar, which is designed as a follow-up to course #1010, will show you techniques that minimize operating costs in commercial data communications networks. The course includes class study and discussion of your own systems, as well as procedures, approaches and algorithms for evaluating and cost-optimizing network operations.

Cost for the seminar, including an extensive set of customized course materials, continental breakfasts and luncheons, is $450 for the first registrant, and $400 for additional registrants from the same company.

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Services Growing 20% Yearly; To Reach $7.9 Billion in 1979

(Continued from Page 43)

Large size, processing-type companies and medium size, software-type companies are expected to lead the industry in growth and profitability during the next few years, Murphy said.

In terms of annual rate of growth of computer services revenue, large processing firms grew 18% in 1975 and medium firms, 10%. Large software companies gained an estimated 20% while medium firms gained 24%, he said.

In 1975, the computer services industry accounted for annualized revenues of $4.6 billion, Murphy said. He projected revenues of $5.5 billion for 1976; $6.5 billion in 1977; and $7.9 billion in 1978.

The majority of large processing companies have experienced a period of profitable growth and are now specializing their services to meet high growth target markets. Many such market opportunities are expected to develop over the next three years, he noted.

Many medium size software companies have achieved a high level of success with a limited product line of software packages. The market awareness and acceptance of these packages has increased significantly over the past two years – due partially to the restricted budgets of 1974-1975 when purchased software improved productivity and due to the improved reliability and documentation of software packages.

The market potential for existing packages is still believed to be large and should provide very profitable business for these companies over the short term.

In the long term these companies will have to diversify and enhance their product line of software packages in order to sustain their current rate of growth, he stated.

Financial Analysis

Detailed financial analysis of small, medium and large processing companies indicates that companies with processing revenues greater than $10 million are above the threshold to realize economy of scale benefits. A total of 82% of the large companies achieved gross profit margins greater than 5% while this percentage drops to 62% of the medium companies ($2-$10 million in revenue), Murphy said.

Both sizes of companies, however, give evidence of marketing processing services that rely more on their specialized skills than on their computer hardware resources.

A total of 61% and 57% of the processing revenues of large and medium size companies respectively come from specialty services, with medium size companies much more dependent on courier delivery than are the large companies. It is apparent that the medium companies that do not have data transmission resources are limited in their growth potential, he said.

IDC projects the industry revenues to increase 20% per year over the next three years. Input/output services are expected to have the lowest rate of growth (8%-9%) and software packages are expected to have the highest rate of growth of the product categories (in excess of 30% per year).

Specialty processing services are also expected to grow at a rate in excess of 25% per year during the forecast period, he noted.

The good, the bad and the misunderstood.

A Special Report on Data Base Management Systems in our October 25th issue.

Data Base Management Systems don't always work. And the problem isn't always with the system -- often it's with the managers.

In our October 25th special report on data base management, we'll include a look at some of the reasons for DBMS failures. Often the failure can be attributed to the use of the wrong system, but there are other reasons as well.

Management doesn't always understand the problem, and it may not be solvable with any DBMS system. It may be a hardware problem -- or a people problem, for example.

Or, a DBMS system might be an appropriate solution to the problem, but there's lack of commitment to its installation. DP managers may not be cooperative, and users may refuse to go along. Failure is the result, but it's not the system's fault.

We won't be dwelling entirely on failures, of course. We'll spend a lot of time looking at successful DBMS applications, with stories from users, analyses of systems in use and case studies. All-in-all, it should help you manage your data base better. And it could help you avoid a costly mistake.

COMPUTERWORLD

How to make sure your contracts work for you instead of against you.

In just two and a half days, *"Legal Tools for Computer Contracting and Protection"* will give you what you need to know to protect your equipment, your systems and your organization.

When the lawyers for one of your suppliers sit down to draft a contract for you to sign, you can bet they don't have your best interests in mind. But you don't have to be defenseless. Given a basic knowledge of the unique problems of contracting in the computer industry, you can make sure your contracts are working to get you what you're paying for — not protecting the other guy from his mistakes. And that's just what this seminar can do for you. We will even review your current contracts — right in class.

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Roy Freed, the seminar leader, will review all types of contracts impacting computer use, including:

- the lease or purchase of systems — bundled or unbundled
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- and others

In addition to a basic review of the laws regulating DP contracting and taxation, you'll learn how to apply the legal rules in a positive way to gain advantage for yourself. And *bring your own contracts, because they will be an important part of the course work.* All registrants are invited to bring their contract forms to the seminar for discussion and review to the extent feasible.

In the workshops you'll gain practical experience with the techniques under study. You'll learn, for example, how to recognize opportunities to negotiate; how to establish performance goals and conditions while you can still do something about it; how to avoid costly litigation and resolve disputes; and how to achieve significant tax savings through the proper structuring and wording of contracts. Plus, you'll gain valuable experience with techniques for handling any transaction. Overall, you'll have an excellent chance to learn a great deal in a short time, as many of our earlier participants have found:

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F. Ford, Entrax, Burlington, Mass.

"I considered this to be a very good fundamental review of basic problems associated with EDP contracting."
J.M. Aubry, Canadian Government

"This was an exceptionally well organized seminar. The material presented was significant and useful. This seminar would be of great practical value to someone without computer contracting experience as well as serving as a useful outlet and review for those with more background and experience."
William C. Prinn, Director, Advanced Planning
Chessie System, Baltimore, Md.

"I had no idea that we would have the opportunity to communicate so closely on an informal basis. That, combined with your excellent preparation, made this experience the most rewarding seminar experience I've had. I commend you for what I regard as a most worthwhile seminar, and thank you for your genuine interest in communicating with, and not merely to the participants."
SV, Attorney, Worcester, Mass.

"The appropriateness of this seminar is extremely important. This area of the Computer Science field has generally received little or no attention from user, vendor or the legal professions."
D.J. Connelly, Development & Control Manager
Norton Company, Worcester, Mass.

Roy N. Freed is the Seminar Leader

Roy N. Freed is internationally known for his acuity and expertise in this field, and he will personally direct the entire seminar. A graduate of Yale Law School, Roy has served as inside counsel for a major manufacturer of digital computers; and is currently engaged in private corporate practice in greater Boston with the firm of Pollock, O'Connor and Jacobe. He teaches at Boston University Law School, and has written many articles on this subject, including "Computer Fraud, a Management Trap" (Business Horizons), and "Get The Computer System You Want" (Harvard Business Review). He is the author of the book, *Computers and Law — a Reference Work*, now in its fourth edition, and he also edited the complete, extensive course materials used in this seminar.

Charges and Enrollment

The charge for the entire 2½ day seminar, including continental breakfasts, luncheons, and all course materials is $325 per registrant. Additional registrants from the same company are charged only $275. This does not include hotel rooms, if necessary, but we have reserved space at the seminar hotels for attendees who wish them.
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Suits Born of Telex vs. IBM Clog Courts

(Continued from Page 43)

guarantee of it, according to IBM, presumably by contesting any payments to Walker.

Oklahoma law as cited by Walker notwithstanding, IBM maintains it shouldn't have to pay the fees of the losing party's attorney. The issue isn't just how much Walker will get in the upcoming hearing before the Oklahoma court, but who will pay the fee, IBM contended.

Should this court hold IBM liable for any part of Walker's fees, the corporation will seek that money from Telex and Wheeler.

Suit Number Three

In the third suit filed in the Tulsa court involving this same cast of characters. the Telex counterclaim states that it entered into litigation against IBM in the first place at Walker's urging. The agreement at the time was that the attorney's fees would be contingent on a net favorable outcome for Telex.

In its petition against Walker, Telex argues the lawyer knew or should have known that IBM would attach a counterclaim to the Telex antitrust suit alleging Telex had stolen trade secrets from IBM.

Walker failed to anticipate this and then to advise Telex of it. He also neglected to prepare an adequate defense for Telex against IBM's charges, according to Telex.

In the long run, Telex maintains Walker's negligence resulted in the $18.5 million judgment from the Third Circuit Court of Appeals in favor of IBM on the trade secret matter, with no offsetting antitrust judgment in favor of Telex.

'Code Violated'

Charging Walker violated the code of professional responsibility of the American Bar Association and of the Oklahoma Bar Association, Telex said he put his self interest in obtaining a large antitrust settlement against IBM ahead of the defense of Telex against the trade secret charges.

In addition, Walker told Telex he was experienced in antitrust litigation; the company contended that representation was false and his experience was actually very limited.

Over half the amount Telex seeks from Walker is owed to additional attorneys he retained to help him in the litigation by Telex against IBM, Telex's papers stated. One of these attorneys has brought his own suit against Telex for his fees, however.

Walker said he and his attorneys have filed a response to Telex's counterclaim denying both allegations.

Under his contract with Telex, Walker explained, either Telex or he could hire additional lawyers. Telex did so, and therefore should be responsible for payment to them.

He said he did not hire, nor did he recommend hiring, additional lawyers and sees no reason that Telex should seek to recover these fees from the payment he is seeking.

In addition, Walker said although he wrote an opinion letter recommending Telex initiate its law suit with IBM, the decision to file the suit rested with Telex.

Lasky's case was filed a year ago and scheduled for trial in November or December. Lasky said his agreement to represent Telex included a written contract he would be paid $1 million.

The Telex suit against IBM was filed in February 1972 and was dropped in October 1975. While at one point Telex was ordered to pay $21.9 million and IBM to pay $259.5 million, an Appeals Court then ruled IBM's practices not predatory and ordered Telex to pay $18.5 million for theft of IBM trade secrets.

Litigation efforts ended when Telex withdrew its appeal to the U.S. Supreme Court in return for release of payment of $18.5 million to IBM.

Name Change

SUNNYVALE, Calif. – Selecting what he termed a "nondescript name," President James Woo announced Data Disc, Inc. has changed its name to Amcomp, Inc.

It is developing an editing system for use by newspapers.

In addition to fixed-head disk products, the firm makes tape drives, graphic display systems and slow motion/stop action TV recorders.

NDTICE TO BIDDERS

Commonwealth of Massachusetts, Department of Public Welfere, Office of Menegement Services, Medicald Menagement Informetion System-R193611.

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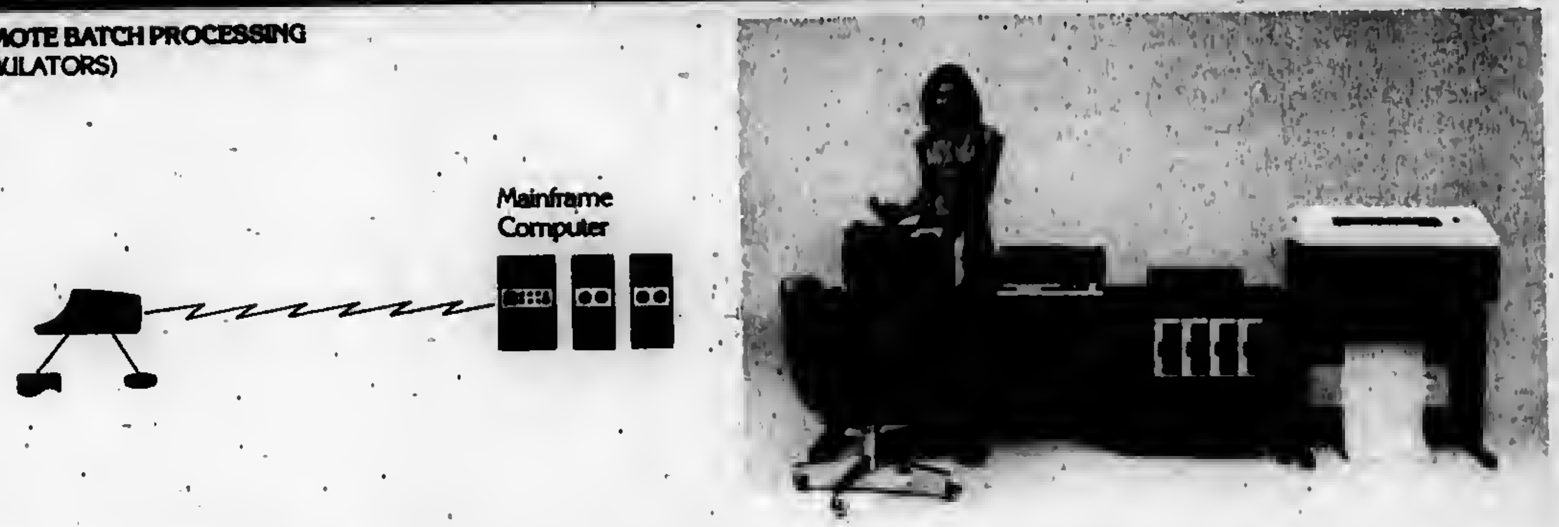

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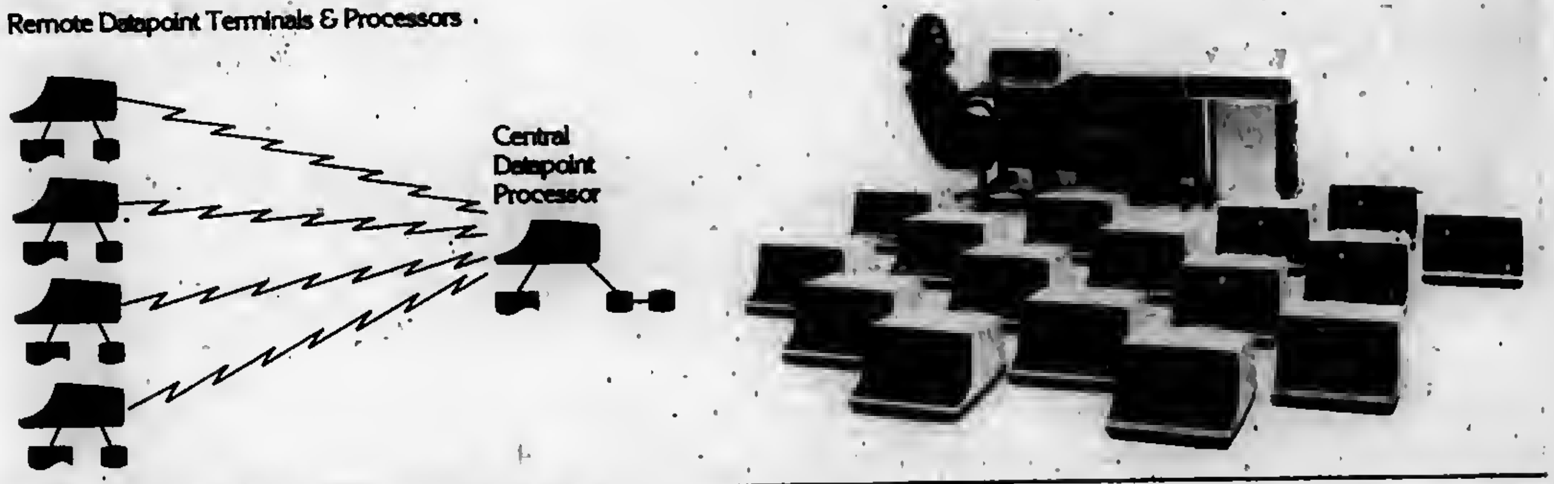
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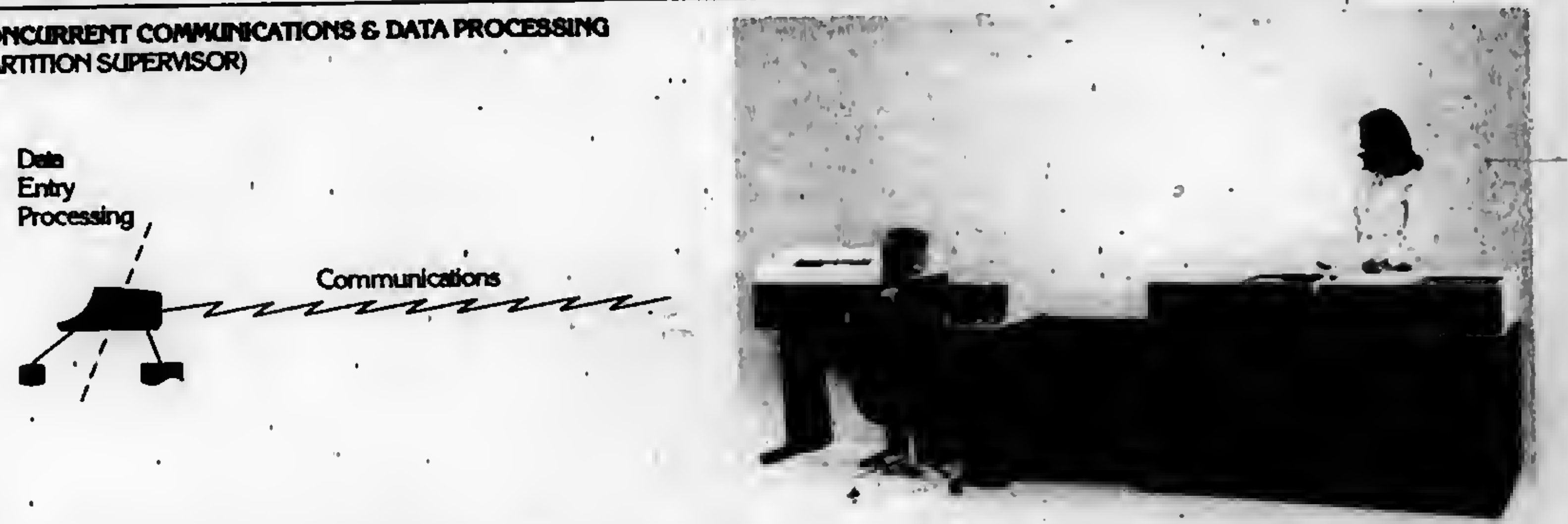

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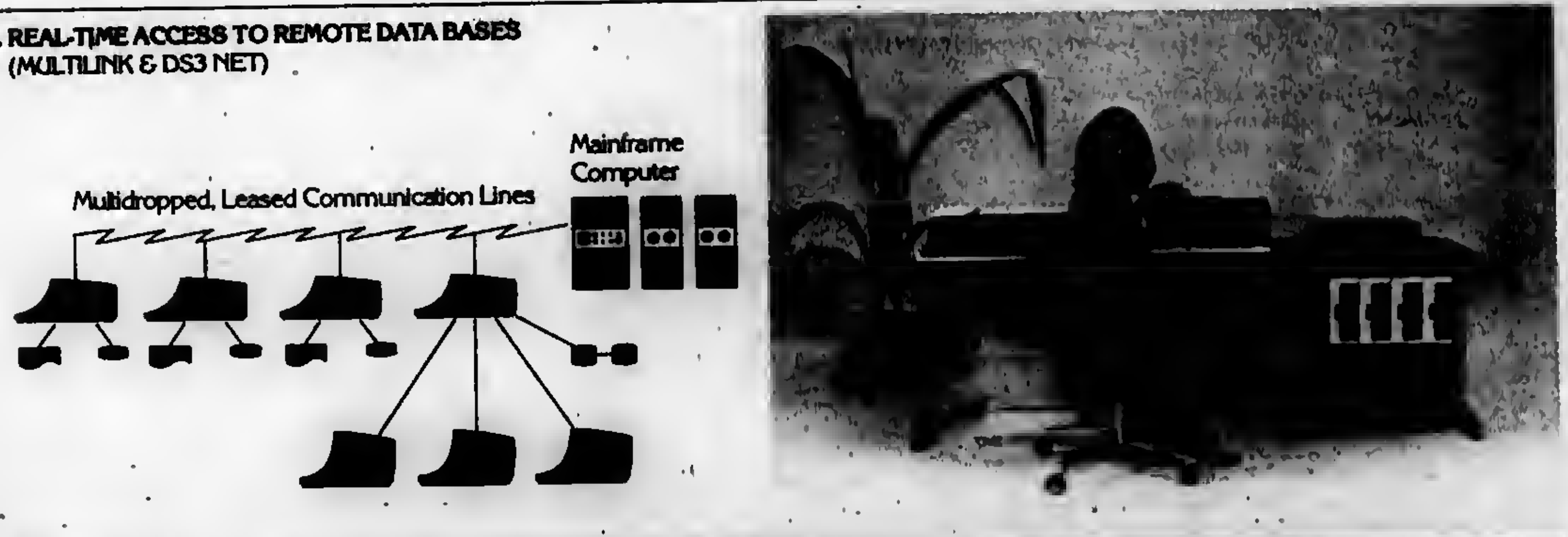

Services Grow as Mainframe Mart Grows: Edelson

By Molly Upton
Of the CW Staff

NEW YORK – The services business grows in proportion to the mainframe and computer business, not the other way around, Harry Edelson told the Association of Data Processing Service Organization's (Adapso) analysts meeting here recently.

And the computer market will continue to grow since the increasing improvement in price/performance ratios make it economically necessary to buy new equipment, according to the senior analyst at Drexel, Burnham & Co.

Slicing up a lemon meringue pie, Edelson illustrated that, of the $22 billion DP industry, services amount to about $4 billion; peripherals, $8 million; mainframes, $6 million; and minis and forms suppliers, $2 billion each.

DP services firms should not fear the increasing growth of minis and terminals, but should move with the tide and capitalize upon the expanded markets, he remarked.

"Saturation in the computer business is very far off and it's nonsense to even talk about it," Edelson said. The computer business is not like the auto business, where a consumer buys a new car that does the exact same thing as his old auto because he feels like it.

"In the computer business, you have to buy a new computer. You're an economic idiot if you don't. It's price/performance that impels you to buy it and that's the definition of a growth industry," he said.

The DP industry continues to grow because it "makes economic sense to buy new computers. When that cycle ends, maybe in 10 or 15 years, then you can talk about reaching some element of saturation."

Although computers may not seem to be growing as fast as services, with $6 billion compared with $4 billion, this isn't true in terms of performance.

"Taking the $6 billion worth of mainframes being sold and translating it in terms of the power available 20 years ago, you're talking about $6 trillion in value. So customers are getting much more value for their dollar in hardware than they are in software," he explained.

"The dollar amount to the hardware vendor hasn't grown that fast because he's been giving more value for the dollar.

"Services are growing, but a lot of it is illusory because in selling software packages the vendor is passing along the increased costs of the people writing the programs," Edelson said.

Minicomputer firms will continue to move more into the area of problem solving, which includes software, he said, or else they'll face the "calculator syndrome."

As hardware prices decline, the opportunity for value added will be found increasingly in the services area. For instance, he observed, the mini market has not grown nearly as fast as the small business computer market.

PDP-11/70 Seen Add-On Target

(Continued from Page 43)

"since the entire add-on market is booming, including 360 and plug-in modules.

"That's one of the reasons we went after the 11/70, that it fits rather nicely with all of the add-ons that we have, particularly where we are slowly becoming an end-user rather than an OEM company," Ray said.

Ampex expects 11/70 add-on sales to be about 2% to 3% of its total business this year, according to Ted Conant, product marketing manager for minicomputer memories.

"We expect our sales on this item to be substantial within a year in terms of shipments. In terms of orders, they'll be substantial by the first of next year," he said.

Ampex's basic memory module is 32K words by 18K or 64K bytes, while the add-on product itself can have two to 16 modules in it, with one to four chassis up to the 11/70's 4M-byte capacity, he said.

"The potential market for PDP 11/70 memory could easily be something in the range of $5 million to $10 million," Conant said.

"If everyone had their products now, the market could be that big now, but all the independents are really just getting started, he said.

Intel's product manager, Gordon Reid, said he felt the 11/70 installed base could amount to some 2,500 users in a relatively short time, within 3 to 5 years.

"The 11/70 is oriented to the timesharing, multiple-use user who is going to require very large amounts of memory, which makes our product attractive on a price/performance basis," he said.

Intel will be pressing DEC the same way it is pressing IBM, he said, by packing more density into a limited space. In the case of the 11/70, Intel is offering 4M bytes of memory where DEC provides 2M bytes.

Advanced Memory Systems will not be going after the 11/70 add-on market, Dick Andreini, marketing manager, stated.

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These four areas illustrate ways in which Datapoint hardware and software combine to produce profit-making business processing systems:

1. Remote Batch Processing — Datapoint processors with associated peripherals, including card readers, printers and disk and tape storage units, provide a world of "intelligent" remote batch capability, capable of changing to different communications disciplines as required. Emulation routines are available for IBM HASP 360/20, 2780 and 3780 units, Honeywell GRTS, Univac DCT 2000, Control Data's UT 200 and Burrough's TC 500 terminals.

2. Field Data Gathering and Distribution — for the collection of business data from field locations. Datapoint's DATAPOLL communications packages make it possible for a centrally located Datapoint processor to poll other remotely located unattended Datapoint processors on an overnight basis over standard dialup telephone lines to take advantage of the lowest possible Datacom rates. Field equipment can include either stand-alone Datapoint intelligent terminals or processors. During the day, operators may use the keyboard and video display screen on these units for rapid, error-free data entry. This information is then stored on magnetic media until the optimum transmission time. DATAPOLL maintains full file compatibility between systems as the information is transferred.

3. Concurrent Communications and Processing — Under our sophisticated Partition Supervisor, a 5500 processor in a DATASHARE configuration can handle batch processing, communications and other "background" chores while simultaneously servicing up to 16 remote terminals. Users at these remote terminals can perform all necessary day-to-day interactive data entry and processing while batch needs are being met. This eliminates the need for expensive and time consuming shutdowns at local stations while batch processing or communications work is being handled.

4. Real-time Access to Remote Data Bases — Datapoint offers MULTILINK for real-time access to a host computer's data base. Under MULTILINK, Datapoint 1150 and 5500 stand-alone systems along a multidrop communications line can perform all necessary local processing tasks, including intelligent data entry and report generation. When data is not available from the data base, the local processor can ask the mainframe for the desired information. 5500 DATASHARE systems may also be connected to the multi-drop lines, allowing users at each of up to 16 field stations full inquiry capabilities with the host mainframe. If the requested data is not available from the host computer, the host computer can request the information from the other processors on the line. This data transfer can occur totally transparent to the user.

For communications with a Datapoint DATASHARE system, another Datapoint software package, DS3NET, enables field office users of Diskette 1100, 1150, 2200 and 5500 systems to access data files in a host DATASHARE system as well as the files on their own local data base. This alleviates the need for costly and time consuming physical transfer of these files from storage unit to storage unit. DS3NET makes it possible to establish a true corporate wide data base without having to physically deposit files in a central storage unit, relieving a substantial burden on data communications capacity.

With this kind of data communications capability, you'll find that Datapoint equipment is hard to beat for efficient and error-free fulfillment of all of a company's communications needs. The Datapoint commitment to data communications reflects its overall analysis of what business users need to build profitable data networks. With its lengthy lead in dispersed processing technology, Datapoint is in an excellent position to help you out with your expanding computer network and data communications needs. For more information contact the sales office nearest you or Marketing Communications, Datapoint Corporation, San Antonio, Texas 78284.

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Field Service Seen Microprocessor Worry

By a CW Staff Writer

MONTREAL – "Perhaps the next technological advance will not be a computer on one chip, but a computer on two chips so that the person in the field can get into the micro and modify it," according to Harvey Kofsky, president of Digital Devices Ltd.

Speaking to a group at the Canadian Computer Show and Conference, Kofsky said prior to 1965 it would have taken 90 components to do a simple job that now takes about five.

When the shift from transistors to circuits was made, the designer could still follow a basic block diagram. He had only to know the parameters of the black box, not the insides of each circuit, and didn't have to acquire a whole new vocabulary. With the advent of microprocessors, all that has changed, Kofsky said.

One of the major problem areas in dealing with microcomputers is in troubleshooting them, he noted. With the circuits, the designer who built the circuit passed a diagram on to the field representative who serviced it. With micros, the drawings are not yet standardized so, confusion can result, he stated.

Levels of Complexity

Several levels of complexity keep the field service personnel away from the system, he explained.

First, many systems have the requirement that they must not be shut down, either because it takes too long to get them going again, or because the problem will not appear until the system reaches a certain level of operation, Kofsky said.

Not being able to shut down the system makes micros good on the inside but difficult to operate, he continued.

Secondly, the flow chart really doesn't have anything to do with the data, he noted.

A possible solution to the microcomputer field service problem would be to design micros with two distinct processors. The first would be the system to perform the job at hand and the second a front panel with its own memory that can look at and change the data in the first CPU, Kofsky said.

CI Notes

Modular, Banks Set Loan Terms

FORT LAUDERDALE, Fla. – Modular Computer Systems, Inc. has agreed in principle with its banks to revise its current loan agreement. The revision would effectively remedy defaults caused by the company's recently reported second quarter loss.

Subject to satisfactory documentation, the revised loan agreement would convert Modcomp's $11.9 million of loans outstanding into a revolving demand loan, the firm said.

In addition, the banks will continue to have a security interest in a substantial amount of company assets.

Modcomp expects to incur a loss for the third quarter, but said actions taken to correct the problems of the second quarter are expected to benefit fourth quarter results.

Semi Sales Soar

PALO ALTO – Based on sales and booking data for July and cumulative data for the first seven months of 1976, the Western Electronics Manufacturers Association (Wema) reiterated its prediction that the U.S. semiconductor industry will probably exceed the 28% gain estimated earlier this year.

Worldwide sales of all U.S.-based semiconductor manufacturers totaled $262 million during July, reflecting the normal slowing of shipments during summer vacation months, Wema said.

Integrated circuits accounted for $156 million and discrete devices $106 million.

New orders booked during the month totaled $307 million, divided at $189 million for ICs and $118 million for discrete devices, the organization noted.

The industry recorded cumulative shipments of $1.9 billion for the first seven months of the year and cumulative bookings of $2.2 billion, Wema said.

'77 NCC Selling Out

MONTVALE, N.J. – Around 90% of the exhibit space for the 1977 National Computer Conference ('77 NCC) has already been contracted for, according to the American Federation of Information Processing Societies (Afips).

More than 1,000 booths, representing over 200 organizations have been reserved for the conference which will be held at the Dallas Convention Center, June 13-16.

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Consider how these hard-to-match features can boost the cost-effectiveness of your minicomputer or microprocessor system.

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Along with proven *Silent 700* features such as 30-cps printing, virtual quietness and reliability, the 733 ASR offers twin tape cassette drives for low-cost data storage, software loading and off-line data editing.

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Additionally, you can use block or character editing combined with high-speed tape duplicating and fast file search.

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A binary data option allows output of 8-bit binary object code onto cassettes after source code assembly.

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The Model 733 ASR lists for $2895* quantity one including printer and twin cassettes. The OEM's price is even more attractive.

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Merger Activity Flat

CHICAGO – Merger announcements in the computer manufacturing and services field in the first half of 1976 totaled 27, the same as the 27 recorded in the first half of 1975, according to W.T. Grimm & Co., merger consultants.

Merger activity in the first half of 1976 for the 40 industries covered by the Grimm study revealed 1270 transactions, up 5% from the 1205 recorded in the first half of last year.

The increased merger activity in the second quarter can be attributed to the Dow Jones Industrial Average passing the 1000 mark, which reflects the improvement in business and economic conditions, according to William T. Grimm, president. With inflation on a tight rein and interest rates at reasonable levels in terms of rising loan demand, he forecast higher merger activity as the year progresses.

Means of payment for companies within the computer group followed the pattern for overall industry. Of the 18 transactions on which price data was available 9 were for cash, 7 for stock, and 2 for a combination of cash, stock and/or debt.

For all industry, cash was by far the favorite, accounting for 52%, followed by stock with 26%, combinations for 19% and debt for 3%, according to Grimm.

Divisional or partial sales in the computer group were lower than the overall industry percentage. Of the group's 27 mergers, 10, or 37%, were fractional in nature.

For all industry, such transactions – sales of divisions, subsidiaries, product lines or 10% or more of the company's assets – constituted 54% of total merger announcements in the first half of 1976.

CFI Says 'Not Me' to Normal Selling

Special to Computerworld

ANAHEIM, Calif. – In a "me too" media products market, one supplier is saying "not me" to the standard distribution methods of such industry leaders as IBM, Memorex and 3M.

In five years, CFI Memories, Inc. has grown from zero to $11 million in sales, largely on its particular end-user distribution approach, one that company officials say will lead CFI into a much larger market share in the near future.

Unlike most media manufacturers, CFI has based its end-user marketing strategy on the use of independent sales representatives, who not only sell CFI disk packs, cartridges or floppy disks, but many other office supplies for data processing departments.

Other large media products manufacturers distribute their products through a direct sales force or a combination of direct and independent sales people, Robert Miller, vice-president of domestic sales, said.

The problem with those methods, he claimed, is the first is geared to large buyers whose orders can support the high overhead of a direct sales network and the second causes confusion and abrasion about sales people's territories, all leading to high turnover in personnel.

"We don't feel either of those two systems can be very successful in tomorrow's market," Miller said. "The future market will demand high customer service, competitive prices and quality, even in small orders."

Despite their independent status, its reps are treated much like direct sales people but, CFI doesn't have the overhead costs.

"Our philosophy is that we can foster as much loyalty and motivate independent reps as effectively as if they worked for us directly," Miller said.

To that end, CFI initiated some "firsts" in the industry at the time: CFI will handle all accounts receivables for reps, franchises are free, a Wats telephone line to CFI for direct customer service frees reps of most service obligations and CFI maintains flexible billing procedures for orders.

CFI's most recent rep support changes mark a significant step in commitment to the independent organization, according to Miller. Two full-time regional sales managers have been hired to support the reps. But, they serve as trainers and technical guidance managers as opposed to bosses, Miller explained.

"Many companies have used such a move to start a trend toward bringing sales in-house. We are doing just the opposite, helping strengthen the reps we do have and recruit more independent reps for areas we don't cover currently," Miller added.

But, why is CFI putting so much effort into supporting salespeople who don't have to sell CFI products?

"It's rather simple. Frankly, it is the most inexpensive marketing tool for our products," Miller said. "Our products have a low unit price and profit margin. The cheaper it is to market, the more competitive our prices can be and the higher the profitability."

"We believe that as the market diversifies, with the smaller mainframe sites, distributed data processing applications and minicomputer users becoming a very large part of the media buyers, our service-oriented approach will give us a leading edge in market penetration," he said.

Executive Corner

■ Dr. An Wang has been elected chairman of the board of directors of Wang Laboratories, Inc.

■ L.D. Altman, president of Fabri-Tek Inc. has resigned as president and member of the board of directors. M.F. Mickelson has been appointed in his place.

■ Richard L. Karpen, a former executive of Control Data Corp., has returned to that company as president of Computing Devices Co. of Canada.

■ Edwin R. Campbell has been appointed president of the H.M. Storms Co., a division of Mohawk Data Sciences Corp.

■ Donald E. McArthur, president and chief operating officer of Carterfone Communications Corp., has resigned and will be replaced by James K. Devlin. Bill E. Brice has been elected chairman of the board.

■ Ephraim Gitelman has been named president of Computek, Inc.

■ Peter Haworth has been appointed director of sales and Brian Quarm as director of manufacturing at Data Recording Instrument Co., Ltd.

■ Roy L. Ash has become chairman and chief executive officer of Addressograph-Multigraph Corp.

■ Edward J. Gunnigle has been appointed to the board of directors of Applied Digital Data Systems, Inc. (ADDS).

■ Norman Frank has been appointed vice-president and treasurer of Compuscan, Inc.

■ Henry W. Weiss has been appointed vice-president of product marketing of Centronics Data Computer Corp.

■ Ronald L. York has been appointed vice-president/systems management for Informatics, Inc's Information Processing Services Division.

■ Dale W. Darnley has become vice-president of Industrial Systems Division of Brandon Applied Systems, Inc. and Jack J. Merkin has become vice-president for the System Development Division.

■ John P. Emmerich has been appointed vice-president of administration for Ontel Corp.

■ Gerald S. Newton has been appointed vice-president of media development for Information Terminals Corp.

■ William A. Sommerfield has been elected vice-president and editorial director of Auerbach, Inc.

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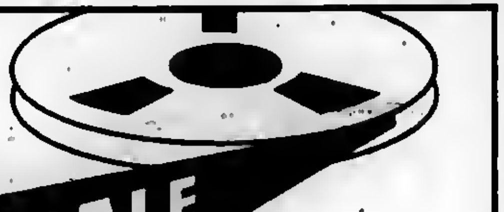

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Process Control Market to Grow At Compound 15%/Year Rate: CSI

SAN JOSE, Calif. – The market for U.S.-made process control equipment will grow at a compound annual rate of 15% through 1980, according to Creative Strategies, Inc. (CSI).

Shipments by U.S. suppliers will grow from the current level of $1.96 billion to $4.03 billion by 1980, a CSI report said, noting the industry spent $3 billion on process control equipment last year although it is cautious about becoming fully automated.

The projected growth "will be driven by pressure to increase productivity and a growing recognition that automatic control can help this," the report said.

Growth in international markets will be faster than in U.S. markets as foreign manufacturers try to catch up to the U.S. in productivity, the report stated, predicting international markets will represent 48% of the total demand by 1980.

"Also contributing to the expanding use of process control equipment is the increased importance of energy conservation and pollution abatement," it added.

Primary, Secondary Reasons

High purchase, installation and programming costs are secondary considerations in determining whether to install a process control system, according to CSI. The threat of system failure, which could cause a plant to completely shut down, is the main reason industrial automation is not always implemented, it explained.

Industry is cautious in choosing its suppliers mainly because of the risk involved in installing process control systems, the report stated, noting the market is therefore highly segmented and served by many specialists.

NDN Schedules Regional Shows

LOS ALTOS, Calif. – The schedule for the 1976-77 Computer Shows, one-day regional presentations for the OEM and end-user markets sponsored by Norm De Nardi Enterprises (NDN), has been finalized.

The two remaining presentations this fall will be the New England Computer Show at the Chateau de Ville in Framingham, Mass., on Oct. 14 and the California Computer Show in Palo Alto on Dec. 2 at the Hyatt Cabana.

The 1977 schedule will include the usual four California and one New England show.

Further information is available from NDN at 95 Main St., Los Altos, Calif. 94022.

Officers, Directors Elected by Electro/77

BOSTON – New officers and members of the board of directors of Electro/77 have been elected.

Frank Tylinski of Frank Tylinski Co. was elected chairman of the board and Richard L. Weaver of Hewlett-Packard Co. was named vice-chairman.

Frank H. Williams of Servo Corp. of America was elected convention director while Arthur Hansen of Hansen Associates was elected show director.

Newly elected members of the Electro/77 board include Dr. Harold Goldberg of Data Precision Corp.; Carroll G. Killen Jr. of Sprague Electric; Arthur L. Rossoff of the Polytechnic Institute of New York; and Frank E. Schink of the Port Authority of New York and New Jersey.

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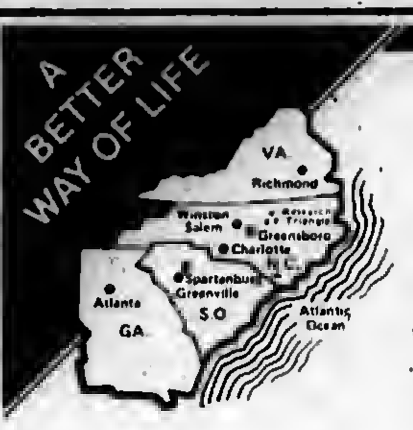

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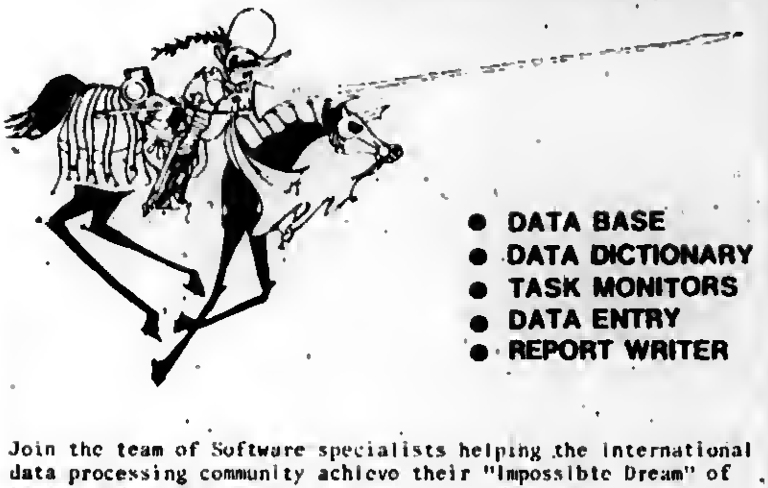

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San Francisco Peninsula

Our Software Engineering Department is continuing to grow. Professionals who join us will help expand the state-of-the-art in such areas as MULTI-PROCESSING, MULTI-COMPUTER NETTING, DATA MANAGEMENT, SIGNAL PROCESSING, OPERATING SYSTEMS and REAL-TIME SOFTWARE SYSTEMS.

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Extensive storage and retrieval from large multi-user technical data base. Requires 1-5 years' experience in detailed design and implementation.

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5-10 years' experience performing software systems engineering or task management of 10-30 man real-time intelligence system software development projects.

For confidential consideration, please submit your resume including salary history/requirements to Dept. CW 287, P.O. Box 188, Mt. View, CA 94042. An equal opportunity employer, minorities and females encouraged to apply. U.S. citizenship required.

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BS, MS, or PhD or equivalent in Business Administration, Engineering or Computer Science. Experience in computer programming including knowledge of COBOL or PL/1, system analysis techniques, and data structures. Ability to communicate with wide variety of users on data base needs, prepare proposals, provide documentation, and solve problems creatively. Desired are a background with data base management systems and experience with large scale IBM systems and report generation systems (RPG, MARK IV, COBOL.)

As a member of the Information Systems Section, selected candidate will interact with staff members of other ANL divisions as a consultant in problem definition, data organization, system analysis, report design and definition, and general computer support including programming.

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PhD or MS in Physical Science or Engineering with extensive experience in the use of computers. Knowledge of data management techniques and OS/360 internals would be valuable.

As a member of the Systems and Applications Section, selected candidate will work in the ANL Central Computing Complex — whose primary machine is an IBM 370/195. Must be able to fill all the roles of System Analyst, Programmer and Technical Writer. Will participate in systems planning and high priority development work for improving the efficiency and utilization of hardware. Specific areas of development are data management, time sharing, user education & consultation, and graphics support.

Send resume, including salary history, to: Mr Walter McFall, Argonne National Laboratory, 9700 South Cass Avenue, Argonne, IL 60439

Argonne National Laboratory

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COORDINATOR FOR ONLINE SYSTEMS

B.A. degree in computer science or related field or equivalent experience with on-line (teleprocessing) system including over five years experience in programming (COBOL and Assembler Language). Perform technical and supervisory duties to design, develop, implement and supervise online systems, including record keeping systems and procedures for our South Texas clients. Send resume and salary expectation to Personnel, Education Service Center, Region 20, 1550 N.E. Loop 410, San Antonio, Texas 78209.

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Exceptional opportunity for experienced computer system analyst to direct the importation or development of complex administrative systems. If you have a technical ability to grasp new computer technology, a talent to deal effectively with others, demonstrable skills in organizing and writing proposals, and 5 or more years of relevant practical experience in administrative data processing, this position will challenge you. Bachelors in related area essential; advanced degree or course work in Computer Science is desirable. Salary commensurate with experience plus excellent fringe benefits.

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SYSTEMS PROGRAMMER

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programmers

Career opportunities presently exist in our EDP installation with twin 370-145's operating under OS/VS1 and VM/370 with CMS.

The successful applicant will have 1-1-1/2 years programming experience on an IBM 360/370 under OS, including 6 months of MARK IV experience. A working knowledge of ANS-COBOL, would be helpful. Experience could include batch, real-time or remote teleprocessing related to commercial data processing applications.

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SYSTEMS ANALYSTS

SCIENTIFIC APPLICATIONS OR MINI-COMPUTER APPLICATIONS

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Requirements are a degree in computer science, math or engineering and a demonstrated proficiency in (1) designing and developing complex systems on large scale computers and/or (2) implementing mini-computers based real time systems. The applicant will have experience with a programming language such as FORTRAN, ALGOL or Assembler.

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You will be resonsible for planning, designing and developing software tools and procedures which will augment and complement the structured programming and design technologies used in the development of engineering software. The ideal candidate should have a minimum of 5 years experience in system software development and be adequately skilled in PL/1.

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Minimum 4 years OS Systems Programming and 2 years VS1. Applicants should also have 3704/3705 and teleprocessing experience along with CICS or CICSVS systems programming.

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Minimum 3 years data processing experience including JCL, teleprocessing and assembly language. OS or OS/VS1 systems programming experience a must.

SENIOR PROGRAMMER
Two or more years COBOL or other high level language, plus a familiarity with OS or VS, JCL, utilities and debugging. A desire to work with clinical systems a must.

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East: Boston (617/237-3120), New York-New Jersey (201/687-8700), Philadelphia (215/665-1717), Washington, D.C. (703/790-5610).

Midwest: Chicago (312) 782-0857), Cleveland (216/771-2070), Detroit (313/352-6520), Kansas City (816/474-3393), Minneapolis (612/544-3800), St. Louis (314/862-3800).

South & Southwest: Atlanta (404/634-5127), Dallas (214/638-4080), Fort Worth (817/338-9300), Houston (713/626-8705), New Orleans (504/523-2576).

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Degree + 5 yrs exp. IBM 370 OS/VS 1, COBOL, JCL, FINANCIAL APPLICATIONS. to $29K.

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Data General is one of the world's fastest growing computer manufacturers. Our family of computer systems like the NOVA® and ECLIPSE® have been responsible for sales of over $100M in eight short years. As a result of this dynamic growth and expansion, our international marketing division needs highly motivated and experienced individuals for assignments in our Scandinavian operation. If you are fluent in one or more Scandinavian languages, and are interested in one of these senior field positions outlined below, call us immediately.

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All responses will be acknowledged and held in strictest confidence.

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Our product line includes the highly successful CA-SORT system with over 800 installations throughout the world as well as other software products for DOS, OS, VS and a full line of software for VM/370. Sales reps are needed for territories throughout the United States and Canada. Previous experience with system type packages is desirable. If you are not afraid to work and want to be well compensated for your efforts, contact us.

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This position requires individuals who can work with a minimum of supervision. Background to include software system programming for IBM 360/370 series. Candidates must have experience on DOS and/or DOS/VS internals. Teleprocessing experience is desirable. Excellent opportunity to develop with a dynamic software company and join the exciting world of software products development.

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Systems analyst with 3 to 5 years IBM BAL and/or IBM COBOL experience desired. Experience with commercial bank automated applications preferred. Excellent opportunity with attractive benefits. Send salary requirements and resume to:

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- Bachelors degree in computer science, related field or equivalent work experience.
- 4-6 + years Systems programming and Systems software development in teleprocessing on medium to large scale IBM 370 Systems or mini-computer message switching systems.
- Software experience with BTAM, QTAM, TCAM, VTAM, CICS, IMS, SNA, NCP and SOLC desirable.
- Teleprocessing network planning, load analysis and performance tuning of on-line systems experience a definite plus.
- Competitive salary, commensurate with experience.

For a confidential review of your qualifications, please send your resume along with salary history to Shermen O. Welker, Jr., Manager, Planning and Technical Services, City Hall, Room 6, San Francisco, Ca. 94102.

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Responsible for the design, development and implementation of software monitors to measure and evaluate the effectiveness of the IBM VS operating systems with special emphasis on MVS and Job Entry Systems. Candidates must have 3-5 years experience developing or modifying the VS2R1 or MVS operating systems. Detailed knowledge of MVS supervisor, SRM and IOS internals coupled with a working knowledge of performance evaluation and monitoring techniques required.

Senior Software Engineer

Responsible for the development and implementation of software monitors to evaluate the performance of IBM VS operating systems. Candidates must have a minimum of 3 years experience with in-depth knowledge of VS inernals, supervisor and data management services, system utilities and service aids.

Software Engineer

Responsible for the development and implementation of complex data reduction programs required to analyze the behavior and performance of IBM VS operating systems. Previous background in CPE or CME disciplines coupled with a minimum of 5 years Systems Analyst/Programmer Analyst experience required. Familiarity with list processing techniques desired.

All positions require highly motivated, self-reliant and productive individuals who function well on small professional teams.

Excellent salary and fringe benefits. Please send your resume, including salary history to:

Mr. Thomas M. Hoger
Vice President, Software Engineering

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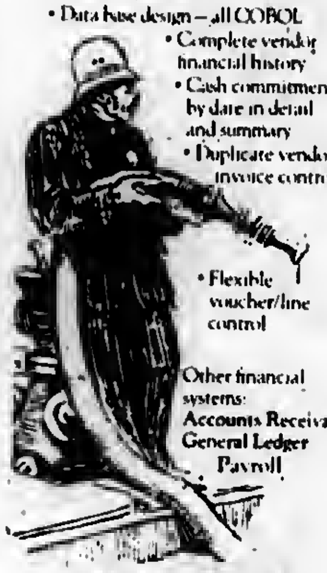

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Rapidata Sees 1977 Down

FAIRFIELD, N.J. – Rapidata, Inc.'s revised contracts to provide services to New York Telephone could reduce the firm's revenues in 1977, its president announced.

A service contract with Acts Computing, however, will partially offset the potential revenue loss, Robert J. O'Brien said.

Rapidata has signed two revised long-term agreements, valued at approximately $8.6 million, with New York Telephone.

One agreement calls for the exclusive use by New York Telephone of one of Rapidata's dual-processor Honeywell 400 systems, for a two-year period.

In an unrelated development, Rapidata entered into a two-year agreement with Acts Computing to supply the services company with Honeywell and DEC computer services to meet Acts' customer requirements.

The minimum value of this contract is in excess of $900,000, according to a company spokeswoman.

Revenues Up, Net Slips In Incoterm Six Months

NATICK, Mass. – Incoterm Corp.'s first-quarter revenues rose, but earnings were half those of the year-ago period.

Second-quarter results also reflected an increase in revenues, but earnings began to recover and were only slightly behind the year-ago period. The same held true for the six-month figures.

In the first quarter, revenues totaled $8.2 million compared with $7.6 million in the same period last year. Earnings dipped to $356,000 or 18 cents a share compared with $713,000 or 36 cents a share after a $193,000 tax credit in the 1975 quarter.

In the second quarter, earnings recovered to $556,000 or 28 cents a share, down from $585,000 or 29 cents a share in the 1975 period.

Revenues for the period were $8.9 million compared with $8 million a year ago.

For the six months, earnings totaled $912,000 or 46 cents a share compared with $1.3 million or 65 cents a share, including the $193,000 tax credit, in the 1975 half-year.

Revenues for the six months were $17.1 million compared with $15.6 million in the 1975 period.

Documation Net Rises in Half Year

MELBOURNE, Fla. – Documation, Inc.'s earnings rose 33% in its first quarter since going public.

Earnings for the second quarter ended Aug. 13 were $634,695 or 24 cents a share compared with $478,170 or 19 cents a share in the same quarter last year.

Revenues rose to $5.4 million from $3.7 million in the year-ago quarter.

For the six months, earnings rose to $1 million or 39 cents a share compared with $736,128 or 29 cents a share in the year-ago period.

Revenues for the six months totaled $8.7 million compared with $6.2 million in the 1975 half-year.

During the second quarter, Documation shipped its first DOC 2250 printer subsystems, which it had previously marketed only to OEMs, to end users.

The continued rise in earnings and total revenues reflected increased shipments of card-handling products, the start of "significant" shipments of the LC 50 card subsystem and initial DOC 2250 shipments, according to S. Ray Halbert, Documation president.

Acquisitions

NCR Corp. has acquired Data Pathing, Inc. The data collection systems firm will operate as a wholly owned subsidiary.

Automatic Data Processing, Inc. has agreed in principle to acquire CPI Group, Inc. for about 240,000 shares of common stock valued at about $7.3 million.

Greyhound Corp. has agreed to acquire the outstanding minority interest in Greyhound Computer Corp., an 84% owned subsidiary.

Tymshare, Inc. has acquired Unitax, Inc. Under terms of the agreement, 144,000 shares of Tymshare common will be exchanged with Unitax shareholders on the basis of one share of Tymshare common for four shares of Unitax stock.

Data Systems, Inc. has acquired Data Midwest Corp.

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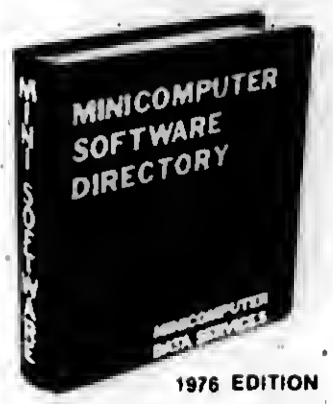

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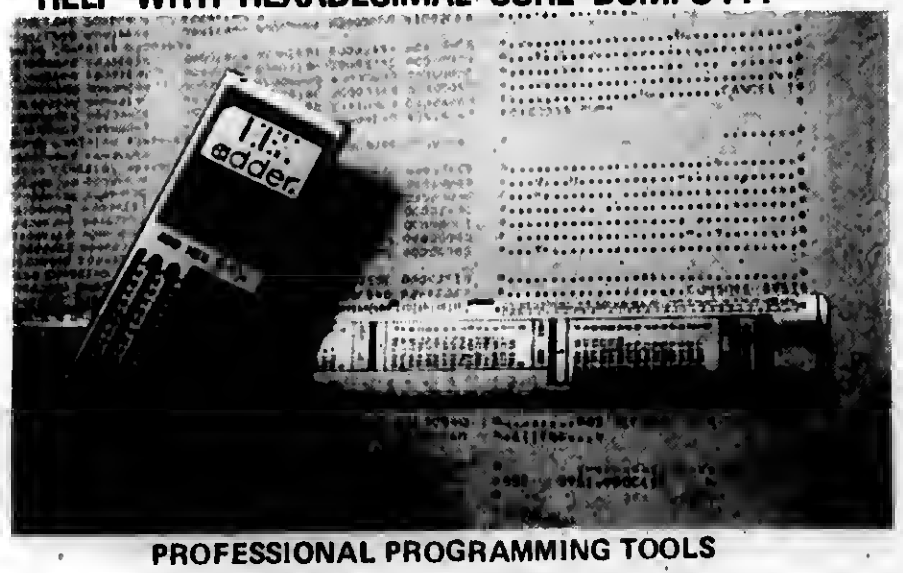

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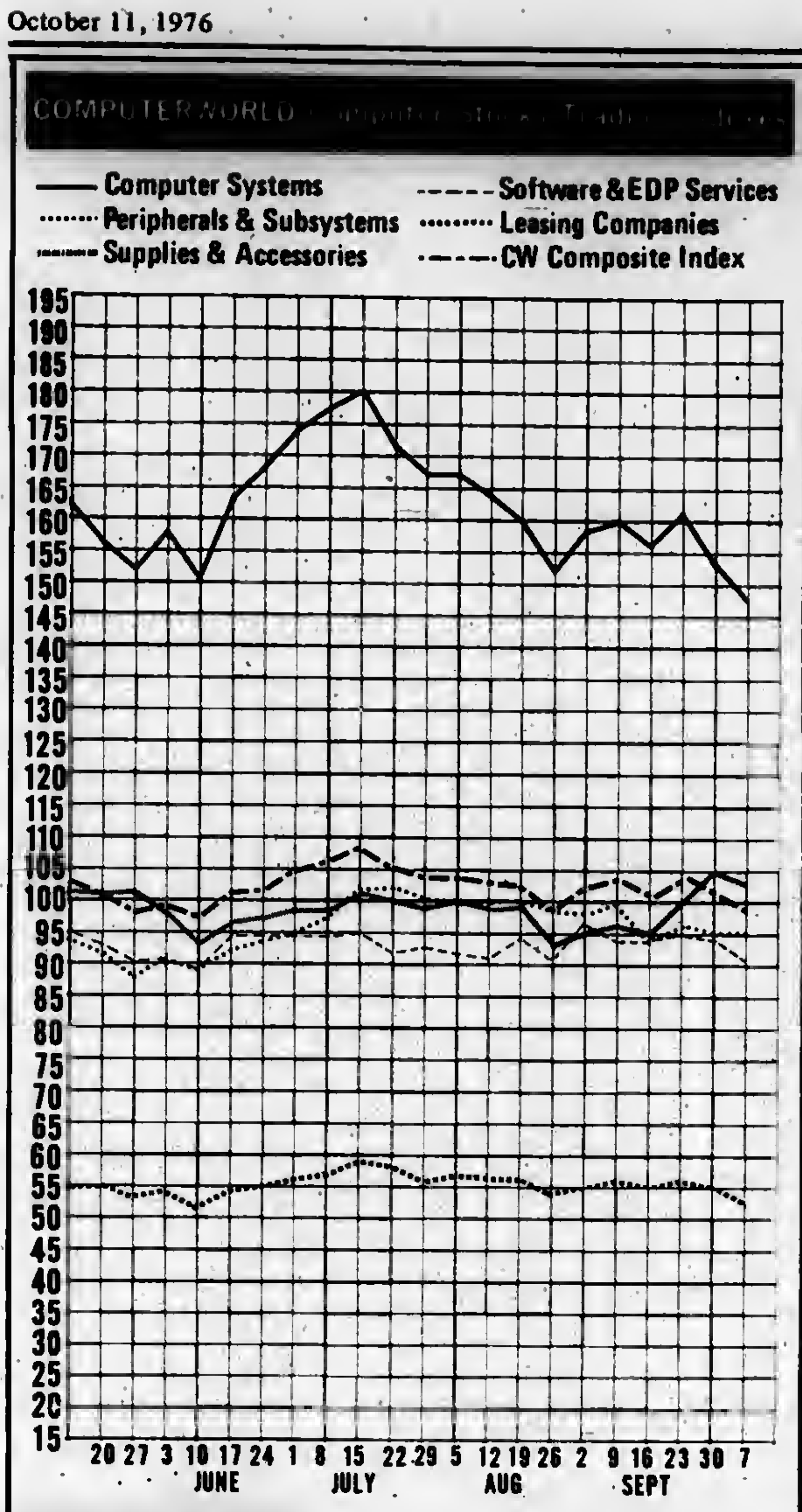

Earnings Reports

AUTOMATIC DATA PROCESSING

Year Ended June 30

	1976	1975
Shr Ernd	$1.22	a$.96
Revenue	187,922,000	154,682,000
Earnings	17,660,000	13,848,000
3 Mo Shr	.35	a.29
Revenue	52,359,000	42,140,000
Earnings	5,146,000	4,143,000

a-Adjusted in June 1976 for two-for-one stock split.

COMPUGRAPHIC

Three Months Ended June 26

	1976	1975
Shr Ernd	$.95	$.84
Revenue	26,254,000	19,117,000
Earnings	2,048,000	1,566,000
9 Mo Shr	2.76	2.35
Revenue	70,480,000	55,852,000
Earnings	5,489,000	4,323,000

COMPUTER ELECTION SYSTEMS

Year Ended March 31

	1976	1975
Shr Ernd	$.90	a$.82
Revenue	8,146,352	8,021,396
Earnings	1,089,359	941,773
3 Mo Shr	.69	a.31
Revenue	3,997,123	2,605,851
Earnings	831,515	357,608

a-Adjusted for 25% stock dividend in July 1975.

COMPUTER PRODUCTS

Three Months Ended June 25

	1976	1975
Shr Ernd	$.11	$.09
Revenue	1,449,643	1,118,045
Earnings	129,857	102,905
6 Mo Shr	.21	.13
Revenue	2,796,293	2,088,110
Earnings	243,274	144,045

FABRI-TEK

Year Ended April 2

	a1976	1975
Revenue	$28,859,948	$35,258,176
Loss	1,542,052	1,678,899

a-53 weeks.

ENNIS BUSINESS FORMS

Three Months Ended Aug. 31

	1976	1975
Shr Ernd	$.26	$.27
Revenue	15,778,787	13,931,717
Earnings	577,954	634,138
6 Mo Shr	.50	.49
Revenue	30,633,319	27,333,185
Earnings	1,108,207	1,134,549

LEGAL NOTICE

U.S. POSTAL SERVICE

STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION

(Required by 39 U.S.C. 3685)

1 Title of publication: Computerworld

2. Date of filing: September 29, 1976.

3. Frequency of issue: Weekly (except single combined issue for the last week in December and the first week in January).

3a. No. of issues published annually: 51

3b. Annual subscription price: $15.00

4. Location of known office of publication: 797 Washington St., Newtonville, Mass. 02160 (Middlesex County).

5. Location of the headquarters or general business offices of the publishers: 797 Washington St., Newtonville, Mass. 02160.

6. Names and addresses of the publisher, editor and managing editor: Publisher, Patrick J. McGovern, 60 Austin St., Newtonville, Mass. 02160. Editor, E. Drake Lundell, 797 Washington St., Newtonville, Mass 02160. Managing Editor, none.

7. Owner, International Data Group, 60 Austin St., Newtonville, Mass. 02160.

8. Known bondholders, mortgagees and other security holders owning or holding 1% or more of total amount of bonds, mortgages or other securities: International Data Group, 60 Austin St., Newtonville, Mass. 02160.

9. For completion by nonprofit organizations authorized to mail at special rates: Not applicable.

10. Extent and nature of circulation:

	Average No. Copies Each Issue During Preceding 12 Months	Actual No. Copies of Single Issue Published Nearest to Filing Date
A. Total number of copies printed (net press run)	78,843	81,575
B. Paid circulation		
1. Sales through dealers and carriers, street vendors and counter sales	none	none
2. Mail subscriptions	74,265	77,807
C. Total paid circulation	74,265	77,807
D. Free distribution by mail, carrier or other means, samples, complimentary and other free copies	2,503	2,703
E. Total distribution (Sum of C and D)	76,768	80,510
F. Copies not distributed		
1. Office use, left over, unaccounted, spoiled after printing	2,075	1,065
2. Returns from news agents	none	none
G. Total (Sum of E, F1 and 2 – should equal net press run shown in A)	78,843	81,575

I certify that the statements made by me above are correct and complete.

Signed Walter W. Boyd
President

Computerworld Stock Trading Summary

CLOSING PPICES WEONESOAY, OCTOBER 6, 1976

All statistics compiled, computed and formatted by
TRADE★QUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		1976 RANGE (1)	CLOSE OCT 6 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	BUPRCUGHS CORP	84-108	88 1/4	-4 1/2	-4.8
O	COMPUTER AUTCMATION	10- 19	15	- 5/8	-4.0
N	CCNTPOL DATA CORP	18- 27	23 1/4	- 1/4	-1.0
N	DATA GENERAL CORP	40- 60	45 1/8	- 5/8	-1.3
O	CATAPOINT CCRP	24- 46	28 3/4	-2 3/4	-8.7
O	DIGITAL CCMP CCNTROL	2- 7	5 7/8	0	0.0
N	DIGITAL EQUIPMENT	139-191	153 1/4	-4 3/4	-3.0
N	ELECTPCNIC ASSOC.	2- 5	2 3/4	0	0.0
A	ELECTPONIC ENGINEEP.	7- 16	8 3/8	- 5/8	-6.9
N	ECKRORC	28- 50	45 3/4	-2 1/4	-4.6
O	GENERAL AUTCMATION	4- 11	4 3/8	- 3/8	-7.8
O	GRI CCMPUTCR CORP	1- 1	5/8	- 1/8	-16.6
N	HEWLETT-PACKARD CO	85-117	89 1/2	-3 5/8	-3.8
N	HCNEYWELL INC	34- 56	44 1/8	-1 1/2	-3.2
N	IBM	227-288	279 1/2	-2	-0.7
O	MANAGEMENT ASSIST	1- 3	1 3/8	- 1/8	-12.0
O	MEMOREX	18- 33	22	+1 1/8	+5.3
O	MICPCOATA CORP	10- 28	22 5/8	-2 5/8	-10.3
O	MODULAR CCMPUTER SYS	4- 14	4 1/4	- 1/4	-5.5
N	NCR	24- 37	34 3/8	- 1/8	-0.3
O	PRIME CCMPUTER INC	4- 14	12 1/2	+ 3/4	+6.3
N	PEPKIN-ELMER	19- 27	21 1/2	-1 3/8	-6.0
N	RAYTHECN CO	45- 67	62 1/2	-1 3/8	-2.1
N	SPERRY RAND	40- 52	47 1/4	-1	-2.0
O	SYCCP INC	12- 31	12	- 1/2	-4.0
A	SYSTEMS ENG. LABS	6- 10	7 3/8	+ 3/4	+11.3
N	VARIAN ASSOCIATES	13- 17	13 1/2	- 5/8	-4.4
A	WANG LABS.	11- 20	14 5/8	- 7/8	-5.6

LEASING CCMPANIES

EXCH		1976 RANGE (1)	CLOSE OCT 6 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	CCMDISCO INC	3- 10	8 3/4	+1 1/4	+16.6
A	CCMMERCE GROUP CORP	2- 3	2	0	0.0
A	CCMPUTER INVSTRS GRP	1- 3	1 5/8	0	0.0
M	DATRONIC RENTAL	1- 8	3/4	- 1/4	-25.0
A	DCL INC	1- 1	5/8	0	0.0
N	DPF INC	5- 8	7 1/8	+ 1/4	+3.6
N	ITEL	6- 15	13	+ 3/8	+2.9
N	LEASCC CORP	6- 19	15 7/8	- 3/8	-2.3
O	LEASPAC CORP	0- 1	1/4	0	0.0
O	NRG INC	0- 1	3/8	0	0.0
A	PIONEER TEX CORP	6- 9	7 3/8	0	0.0
N	U.S. LEASING	7- 12	9	- 1/2	-5.2

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASN
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

SOFTWARE & EDP SERVICES

EXCH		1976 RANGE (1)	CLOSE OCT 6 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED CCMP TECH	1- 3	1 3/8	- 1/8	-8.3
O	ANACCMP INC	6- 11	7 1/8	0	0.0
A	APPLIED DATA RES.	2- 4	3	- 1/4	-7.6
N	AUTCMATIC DATA PROC	17- 35	29	-2 1/4	-7.1
O	COLEMAN AMERICAN COS	2- 6	1 7/8	- 1/8	-6.2
O	COMPUTER DIMENSIONS	3- 7	6	+ 1/4	+4.3
O	CCMP ELECTION SYSTMS	5- 9	5 1/4	0	0.0
O	COMPUTER HORIZCNS	0- 3	1 1/2	0	0.0
O	CCMPUTER NETWORK	2- 6	5 3/8	+ 3/8	+7.5
N	COMPUTER SCIENCES	4- 8	6 1/8	0	0.0
O	CCMPUTER TASK GROUP	1- 1	1 1/2	0	0.0
O	CCMPUTER USAGE	3- 6	3	- 1/4	-7.6
O	CCMSHARE	2- 9	4 3/4	- 1/2	-9.5
O	DATA DIMENSIONS INC	2- 4	2 7/8	0	0.0
O	DATATAB	1- 1	1 3/8	0	0.0
N	ELECTRONIC DATA SYS.	12- 18	15 5/8	+ 1/8	+0.8
O	INFCNATIONAL INC	1- 1	1/8	0	0.0
O	INSYTE CORP	0- 0	1 1/2	+ 1/8	+9.0
O	IPS CCMPUTER MARKET.	1- 2	1 1/8	0	0.0
O	KEANE ASSOCIATES	2- 4	2 1/8	- 1/8	-5.5
O	KEYDATA CORP	2- 5	1 1/2	0	0.0
O	LOGICCN	3- 4	3 3/8	- 1/4	-6.8
A	MANAGEMENT DATA	1- 3	2 1/4	- 1/8	-5.2
A	NATICNAL CSS INC	13- 25	19 1/8	-1 1/2	-7.2
A	CN LINE SYSTEMS INC	18- 22	18 3/8	+ 1/2	+2.7
N	PLANNING RESEARCH	3- 5	3 3/4	0	0.0
O	PRCGRAMMING & SYS	1- 1	3/8	0	0.0
O	RAPIDATA INC	2- 5	1 5/8	- 1/8	-7.1
O	REYNCLDS & REYNOLD	13- 21	15 1/4	- 3/4	-4.6
O	SCIENTIFIC COMPUTERS	0- 0	7/8	- 1/4	-22.2
O	TYMSHARE INC	15- 28	14 1/2	-3 1/2	-19.4
A	URS SYSTEMS	3- 5	3 3/4	- 1/8	-3.2
N	WYLY CORP	2- 7	1 1/2	0	0.0

PERIPHERALS & SUBSYSTEMS

EXCH		1976 RANGE (1)	CLOSE OCT 6 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	8- 13	10 5/8	- 1/4	-2.2
O	ADVANCED MEMCRY SYS	4- 10	6 1/4	- 3/8	-5.6
N	AMPEX CORP	5- 10	6 3/8	- 1/2	-7.2
O	ANDERSCN JACOBSON	2- 4	2 7/8	0	0.0
O	APPLIED DIG DATA SYS	13- 25	18 1/2	-1 3/4	-8.6
O	BEEHIVE MEDICAL ELEC	3- 9	9	+ 1/8	+1.4
A	BOLT.BERANEK & NEW	7- 11	8	- 1/4	-3.0
N	BUNKER-RAMO	5- 10	7 1/8	- 1/8	-1.7
A	CALCCMP	4- 7	4 1/8	- 3/8	-8.3
O	CAMBRIDGE MEMORIES	0- 6	1/4	- 1/8	-33.3
N	CENTRONICS DATA COMP	20- 36	32 7/8	- 3/4	-2.2
O	CCDEX CORP	22- 42	28 1/2	-3 1/2	-10.9
O	COGNITRONICS	1- 1	3/4	0	0.0
O	CCMPUTER COMMUN.	0- 0	5 5/8	- 1/8	-2.1
O	COMPUTER CCNSOLES	4- 7	4 1/2	0	0.0
A	CCMPUTER EQUIPMENT	1- 3	1 3/4	0	0.0
O	CCMPUTER TRANSCEIVER	0- 0	1	0	0.0
O	COMTEN	4- 9	7 1/4	-1	-12.1
N	CCNRAC CORP	20- 25	21	-1 1/2	-6.6
O	DATA ACCESS SYSTEMS	0- 0	4 3/4	0	0.0
O	DATA 100	7- 13	8 1/8	- 7/8	-9.7
A	DATA PRODUCTS CORP	5- 15	11 3/8	-1 3/8	-10.7
O	DATA TECHNOLCGY	1- 2	1 3/8	0	0.0
O	DATUM INC	1- 2	1 1/8	- 1/8	-10.0
O	DECISION DATA COMPUT	1- 4	1 1/2	0	0.0
O	DELTA DATA SYSTEMS	1- 4	3/4	0	0.0
N	ELECTRONIC M & M.	1- 4	3 1/4	- 1/8	-3.7
O	FABRI-TEK	1- 1	5/8	0	0.0
O	GENERAL CCMPUTER SYS	1- 2	7/8	0	0.0
N	HAZELTINE CORP	4- 12	8 1/8	- 3/8	-4.4
N	HARRIS CCRP	34- 55	51	-1 1/2	-2.8
A	INCOTERM CORP	9- 20	13 1/8	+1 3/8	+11.7
O	INFOREX INC	3- 7	4 1/2	- 1/2	-10.0
O	INFORMATION INTL INC	10- 18	11 5/8	- 5/8	-5.1
O	INTEL CORP	54-109	54	-5 1/2	-9.2
A	LUNDY ELECTRONICS	3- 7	3 1/2	- 1/4	-6.6
O	MSI DATA CORP	3- 7	5 3/8	- 1/2	-8.5
A	MILGO ELECTRONICS	15- 21	16 5/8	- 3/4	-4.3
N	MOHAWK DATA SCI	3- 10	6 3/4	- 5/8	-9.4
O	PENRIL CORP	0- 0	2	0	0.0
A	PERTEC CORP	3- 8	6	- 3/4	-11.1
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	3- 10	3	0	0.0
O	QUANTOR CORP	4- 6	4 1/8	0	0.0
O	RECOGNITION EQUIP	6- 11	8 1/2	- 5/8	-6.8
N	SANDERS ASSOCIATES	6- 11	8 1/2	- 5/8	-6.8
O	SCAN DATA	2- 4	1 5/8	- 1/8	-7.1
O	STORAGE TECHNOLOGY	9- 13	10 1/4	- 5/8	-5.7
O	T BAR INC	5- 10	5 3/4	0	0.0
O	TALLY CORP.	4- 6	4	0	0.0
O	TEC INC	3- 6	6 1/4	0	0.0
N	TEKTRONIX INC	45- 69	64 7/8	- 1/8	-0.1
N	TELEX	2- 5	2 3/4	- 1/8	-4.3
O	WANGCO INC	11- 22	21 1/8	0	0.0
O	WILTEK INC	2- 2	2 3/4	0	0.0

SUPPLIES & ACCESSORIES

EXCH		1976 RANGE (1)	CLOSE OCT 6 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED SYSTEMS INC	1- 4	3 3/8	+ 1/8	+3.8
O	BALTIMORE BUS FORMS	3- 5	3 5/8	0	0.0
A	BARRY WRIGHT	6- 10	9 1/4	- 1/8	-1.3
O	CYBERMATICS INC	1- 1	1/2	0	0.0
A	DATA DOCUMENTS	25- 45	45 1/8	+1 1/8	+2.5
O	DUPLEX PRODUCTS INC	13- 24	14	- 1/2	-3.4
N	ENNIS BUS. FORMS	6- 8	6 1/8	- 1/8	-2.0
O	GRAHAM MAGNETICS	8- 13	9 3/4	0	0.0
O	GRAPHIC CONTROLS	13- 19	16	- 1/2	-3.0
N	3M COMPANY	53- 66	62 1/2	-2 1/4	-3.4
O	MOORE CORP LTD	33- 51	33	-2	-5.7
N	NASHUA CORP	11- 19	16 1/2	-1	-5.7
O	STANDARD REGISTER	15- 19	16 1/2	- 1/4	-1.4
O	TAB PRODUCTS CO	5- 11	9 3/4	- 1/4	-2.5
N	UARCO	20- 25	20 1/8	+ 1/8	+0.6
A	WABASH MAGNETICS	4- 9	7 3/4	- 1/4	-3.1
N	WALLACE BUS FORMS	19- 25	22	- 1/2	-2.

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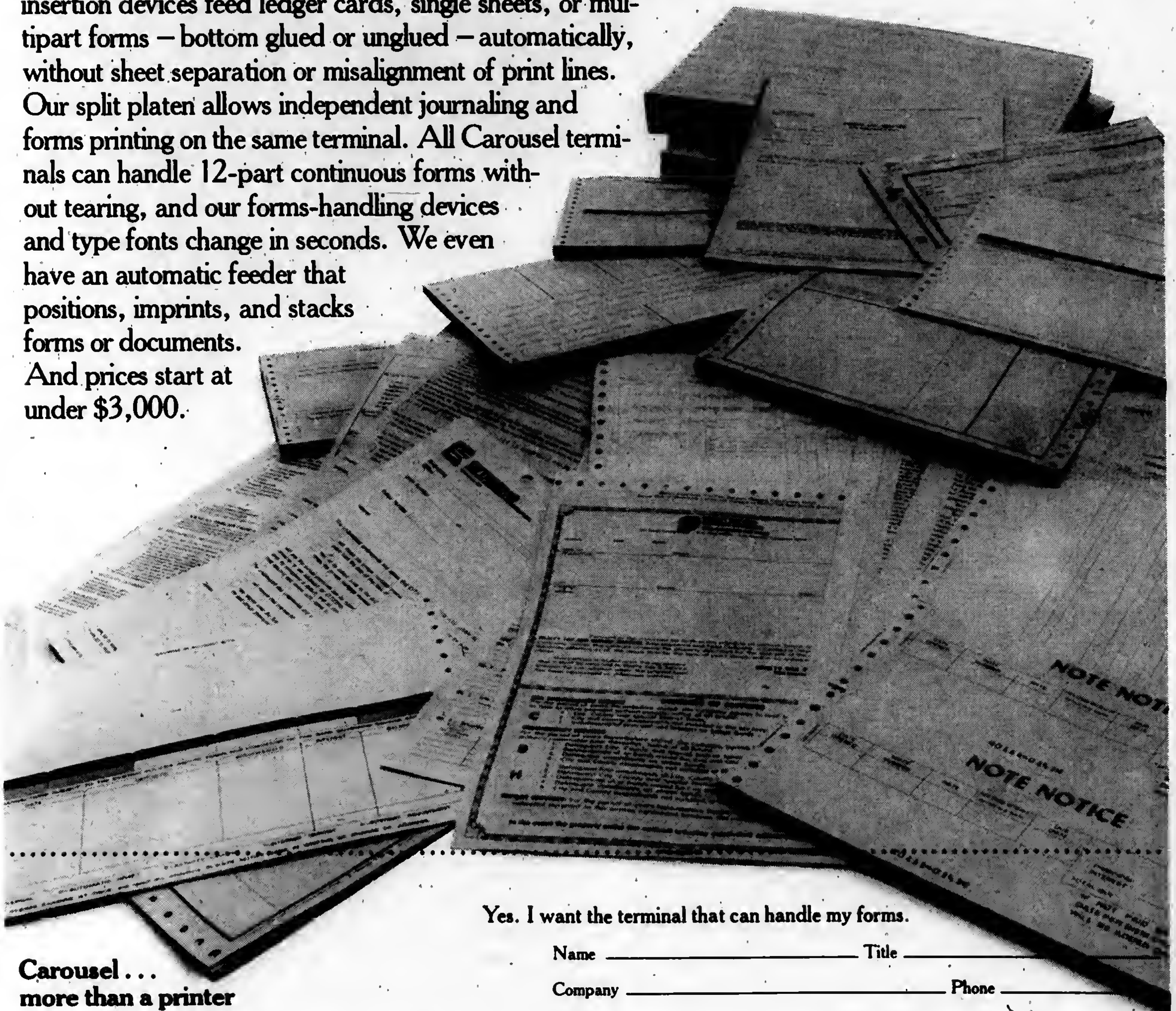

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NEWSPAPER

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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DP Catches Carter Contradictions

By Ann Dooley

Of the CW Staff

GASTONIA, N.C. – Democratic Presidential candidate Jimmy Carter's campaign slogan appears to be "Trust Me," but an Associated Press (AP) computer not programmed on faith alone has detected discrepancies in several of Carter's statements on the right to work.

The *Gastonia Gazette* here recently used the AP data bank on Presidential candidates in uncovering the discrepancies.

The AP computer in Atlanta relayed the information that "Carter has been quoted as saying he had not advocated repeal of Section 14B of the Taft-Hartley Act which allows states to enact right-to-work laws banning shops where all employees must belong to a union.

"When he was governor of Georgia, however, Carter had said if legislators were to repeal the state right-to-work law he would sign the repeal," AP said.

"Last spring, after meeting with AFL-CIO President George Meany, Carter was quoted as saying: 'I think 14B should be repealed.'

"Before meeting with Meany, Carter had said he would not campaign for repeal of 14B, but would sign a repeal if it passed Congress," AP added.

The data bank, which is updated weekly, is implemented on a Hendrix Electronics, Inc. 3400 system based on a Digital Equipment Corp. PDP-8E processor.

Itel Brings Out Two CPUs With IBM Compatibility

By Esther Surden

Of the CW Staff

NEW YORK – As expected, Itel Corp. last week unveiled two CPU members of an IBM-compatible mainframe family, the AS/4 and AS/5 Advanced Systems (AS).

Six models of the mainframes, which are manufactured by National Semiconductor Corp., were introduced and are said to span a range from 1.4 times the power of a system 370/148 to the equivalent of a 370/158-3MP. They are scheduled for delivery in the second quarter of 1977 [CW, Oct. 11].

All models of the AS are field-expandable to larger models without changing the CPU, Itel stated, adding the systems are fully operationally compatible with the 370/158.

Operating systems, program products and user programs which run on a 158 will run on a similarly configured AS model without modification, the firm claimed.

The AS systems were designed to run IBM operating systems in the Native Mode of operation. Model 158 peripherals will also run on the AS systems, Itel said.

Itel intends to provide both hardware and software support for the systems through Itel field engineers, customer service engineers and program service engineers who reportedly will be able to patch or modify the operating systems if necessary.

Permanent operating system changes will be handled by IBM, Itel said, and new IBM operating system releases will be provided to all users of the Itel CPUs.

All models feature virtual storage capability, the company added, and have a CRT, light pen and 180 char./sec printer console.

The AS models have a slower storage read/write cycle time than the comparable IBM systems, but this is offset by the fact they fetch 16 bytes compared to four or eight on the IBM models, Itel said.

The AS/4 configuration runs under DOS/VS, OS/VS1, OS/VS2 and the MVS operating systems; processor cycle time is 115 nsec. The AS/4 features seven internal channels and a memory that ranges in size from 1M byte to 4M bytes.

The AS/4-MP runs under the MVS op-

(Continued on Page 7)

EFT Technologies Don't Mesh

Banks Hit for Ignoring Retailers' Needs

By Toni Wiseman

Of the CW Staff

PHOENIX – Banks and other financial institutions are planning electronic funds transfer (EFT) systems without any thought to the needs of the retailer, Del Olson, assistant corporate comptroller of the Dayton Hudson Co., charged here last week.

Retailers "have no intention of relinquishing their control over 'sacrosanct' point-of-sale procedures or devices to a third party," he said at the National Retail Merchants Association's (NRMA) annual DP and Data Communications Conference here last week.

Coverage of the NRMA's annual DP and Data Communications Conference continues on Page 8.

Bankers are developing electronic devices designed to operate at retailers' point of sale based on magnetic card technology which is incompatible with the optical scanning technology embraced by major retailers, he noted.

This means a bank card will not work in the retailers' OCR-A terminals and vice versa unless additional interfaces are added, he said.

This situation reflects the retailer's fundamental concerns: "We do not want to impair our point-of-sale efficiency by introducing foreign devices or procedures . . . nor are we interested in making costly modifications to our point-of-sale systems which [already] cost millions of dollars to implement," Olson said.

"This is a basic concern which we feel bankers must understand as they proceed in the development of funds transfer systems," he added.

The President's National Commission on Consumer Finance warned in its 1972 year-end report that the commercial banks' expanded and dominant role in credit cards together with their potential control of EFT and, by implication, ownership of the credit information system could lead to an oligopoly, restraining competition unfairly in the consumer credit market, Olson pointed out.

(Continued on Page 2)

House Group Wants Communications Act Completely Revised

By Ronald A. Frank

Of the CW Staff

WASHINGTON, D.C. – The House Subcommittee on Communications has determined a "basement-to-attic rewrite" of the Communications Act of 1934 is needed, according to Andrew Margeson, subcommittee staff economist.

Speaking at a meeting of the Computer Law Association (CLA) here last week, Margeson said subcommittee chairman Lionel Van Deerlin (D-Calif.) has decided to seek suggestions from the public to implement the goal of writing new communications legislation.

The Communications Act established the regulatory framework for the operation of the Federal Communications Commission (FCC). The proposed Consumer Communications Reform Act of 1976 seeks to redirect FCC policies only along specific lines regarding interconnection and competition.

After three days of recent hearings on the Reform Act, however, the subcommittee apparently has decided a general review of the entire 1934 act will be undertaken.

The subcommittee is aware of what is at stake and the outcome will have a definite effect on the computer industry, Margeson said.

(Continued on Page 6)

Kolence: True or False?

By Michael F. Morris

Special to Computerworld

Reacting to " 'Software Physics' Standardizes DP Operations" [CW, Sept. 20] in which author Barry Stevens outlined some of the concepts of Ken Kolence's theory of software physics, this commentary adds a new perspective and challenges the DP community: Prove the theory true or false.

Men and women of science, arise! We have been offered a theory to dismantle.

Full-fledged theories don't happen very often. When they do, they cause disagreement, argument and – sometimes – progress.

Kenneth Kolence – a pioneer in the field of computer performance evaluation – has proposed a theory of "software physics," probably the first to deal exclusively with computers and computer workloads. Is it possible this small bit for man may really be a giant byte for mankind?

We'll have to test it to find out.

Kolence's theory says, basically, that any computer configuration's capacity to do work overtime ("software power," in Kolence's parlance) can be calculated as a vector quantity essentially independent of the demands placed on the equipment by a workload.

Further, the capacity demand by a workload ("software work") can be calculated as a vector quantity independent of the available equipment.

Therefore, a basic and operationally important part of Kolence's theory may be demonstrated to be incorrect if it can be shown the calculated "software work" vector is completed in a time period such that it exceeds the

(Continued on Page 4)

Report Raps Agencies For Wasting Millions With Poor DP Policy

By Nancy French

Of the CW Staff

WASHINGTON, D.C. – Mismanagement in the purchase and use of computers by government agencies is costing U.S. taxpayers millions of dollars, according to a report issued here this month by the House Government Operations Committee.

The product of several months of staff work and three days of hearings this summer, the report criticized six money-wasting practices: bidding on systems by make and model rather than functional specifications; lack of long-range planning; lack of DP standards; failure to review computer utilization; insufficient use of high-level languages; and acquisition of DP equipment without exploring alternative approaches such as services or minicomputers.

The House Government Operations Committee is chaired by Rep. Jack Brooks (D-Texas), author of the Brooks Act, which was aimed at increasing the efficiency and cost effectiveness of federal DP activity.

The hearings and resulting report evolved from the discovery that the percentage of federal DP procurements made by competitive bidding had dropped from 60% in the eight-year period from 1967

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High Court Ruling Stymies EFT Operations of Banks

By Toni Wiseman
Of the CW Staff

Developments in the area of electronic fund transfers (EFT) seem to be occurring mainly on court dockets these days, with laws being ruled unconstitutional, orders rescinded and hearings denied.

Faced with three similar petitions on branching issues – the first from two Illinois banks, the second from a bank in Missouri and the third from the Comptroller of the Currency – the Supreme Court recently denied the Illinois banks a hearing, but has not yet decided whether to hear the other two cases.

The court, in a move destined to impede the growth of electronic banking, refused to review a lower court ruling that off-premise customer bank communications terminals (CBCTs) are branch banks and therefore illegal where branching is prohibited by law.

The appeal was filed by the First National Bank of Chicago and Continental Illinois Bank & Trust Co. [CW, Aug. 2].

The High Court's ruling will deal the hardest blow to banks operating in states such as Illinois and Texas where branching is illegal.

It will also, however, impact banks in states such as New York, New Jersey and Connecticut, where branch banking is permitted on an intrastate basis, by preventing them from using the devices across state lines.

A spokeswoman at Continental said that under current law; this is the end of the trail, the last effort at a reinterpretation of the law.

The only avenue left open to the banks is to go to the Illinois Legislature and the U.S. Congress and try to get the law changed, she said. She would not, however, speculate on whether the banks would consider this possibility.

Continental expects a "cease and desist" order from Judge Wills of the U.S. Court of Appeals in Chicago, putting his earlier decision into effect, but the bank will continue to operate its CBCTs until the order is sent out, she noted.

The First National Bank in St. Louis petitioned the Supreme Court several weeks after the Illinois banks and it is too early to expect notification of whether the court will hear its case.

"Optimistically we'd like to think they will, but realistically we have to figure the chances aren't good after Continental and First National were turned down," a bank spokesman said.

Even if the Missouri bank is turned down, the Supreme Court could decide to hear the Comptroller's case.

U.S. District Court Judge Aubrey Robinson has ordered the Comptroller of the Currency to officially rescind his CBCT ruling, notifying all national banks that operation of CBCTs, unless they have been approved specifically as branches, is illegal.

The Comptroller complied with Robinson's order, but now is asking the Supreme Court to review lower court CBCT rulings that maintain CBCTs are branches.

On a less definitive level, Sen. Thomas J. McIntyre (D-N.H.) is planning a comprehensive study of the entire McFadden Act and its application to the branching issue.

"The study's aim is to examine the legislation in light of current technology and the current marketplace, 40 years after the law was enacted," according to a Senate Banking Committee spokesman. Hearings are tentatively scheduled for December, he added.

This development will no doubt supercede a rough-draft bill which had been circulating in Washington. Tentatively entitled the "Remote Electronic Facilities Act of 1976," it is aimed at amending the McFadden Act to state that remote facilities such as automated teller machines (ATMs) and point-of-sale terminals are not branches.

The draft was never introduced and, in light of the current scenario of McIntyre's study, there is some doubt it will ever appear, the spokesman indicated.

Meanwhile, on the state level, Judge Raymond Berg of Illinois' Cook County Court ruled Chicago's recently passed financial services ordinance, which would have permitted city banks to operate six community offices and an unlimited number of ATMs, exceeded the city's home rule powers under which it was enacted [CW, Aug. 2].

The City of Chicago has filed an appeal of Berg's ruling.

EFT Hearings Set

WASHINGTON, D.C. – The National Commission on Electronic Fund Transfers (EFT) has scheduled a series of hearings here later this month.

Hearings on consumer issues are planned for Oct. 26-27; Oct. 28-29 will be devoted to branching issues.

While the witness list is not yet available, the commission has outlined five areas which will be covered in the consumer hearings. These include privacy (unauthorized access and dissemination of information), consumer convenience, consumer legal rights, security from error and fraudulent use and choice in use of financial services and financial service institutions.

Banks Hit for Ignoring Retailers

(Continued from Page 1)

"In the final analysis, EFT will ultimately be successful only with the cooperation of retailers who allow access to their premises and point-of-sale terminals," he said.

To obtain that cooperation, Olson proposed a half-dozen principles on which general merchandise retailers should insist with respect to the future development of EFT systems:

"Retailing should oppose any encroachment upon its proprietary interest and control of its cash management and credit operations, including our customer relations. We should oppose any system which would turn over the control of those functions to some third party.

"We should insist upon the continuation of competition as a basic principle in the development of [EFT] systems so as to be available to all interested parties.

"Retailing should oppose any legislation or regulation that would mandate the pairing of, or use of, a retailer's point-of-sale equipment with any third party.

"Retailing should support only those EFT systems which are privately owned and privately funded rather than any system which is proposed for government ownership or funding.

"We should oppose the enactment of any state legislation which would restrict the ability of any segment of industry to participate in the development and expansion of EFT.

"We should support those proposals which will ensure the open access of all credit grantors to information on credit-worthiness which is held by a consumer reporting agency."

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9	General Electric
10	Chrysler
11	International Tel. & Tel.
12	Standard Oil (Ind.)
13	U.S. Steel
14	Shell Oil
15	Atlantic Richfield
16	Continental Oil
17	E. I. du Pont de Nemours
18	Western Electric
19	Procter & Gamble
20	Westinghouse Electric
21	Union Carbide
22	Tenneco
23	Goodyear Tire & Rubber
24	International Harvester
25	Occidental Petroleum
26	Phillips Petroleum
27	Union Oil of California
28	Bethlehem Steel
29	Caterpillar Tractor
30	Eastman Kodak
31	Rockwell International
32	Dow Chemical
33	Kraftco
34	RCA
35	Esmark
36	Sun Oil
37	LTV
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39	Xerox
40	United Technologies
41	Greyhound
42	Firestone Tire & Rubber
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44	General Foods
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46	Monsanto
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50	Lockheed Aircraft

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Report Raps Federal Agencies for DP Mismanagement

(Continued from Page 1)

to 1974 to only 36% in 1975 (see related story on Page 43).

The General Services Administration (GSA), the Office of Management and Budget (OMB), the National Bureau of Standards (NBS) and the user agencies share responsibility for failing to live up to the nearly 10-year-old Brooks Act, the committee said.

The report was especially critical of the government's practice of seeking new equipment by make and model rather than by functional specifications – a practice that costs more and favors certain vendors.

Make and model procurement should be approved only when the national interest requires such action, the report recommended. Otherwise, requests for procurement should describe needs in terms of functions required.

Interim upgrades, add-ons and replacement systems should be avoided except where a user agency is assigned new responsibilities, the committee added.

Federal agencies are not developing long-range DP plans based on projected missions and programs, the report said, suggesting "each agency should have a five-year plan. Once plans are made, the DP requirements should be stated in terms of functional specifications, the committee stated.

To make planning and procurement more effective, Congress should have line-item appropriation authority for DP, the committee said.

"DP expenditures represent such a significant percentage of the overall budget" that effective management requires DP expenditures be "considered separately," the report said.

As for standards, the report criticized the NBS for its failure to adopt a money-saving I/O interface standard that would give users a greater choice in selecting peripherals.

NBS, which seems to prefer to adopt the voluntary standards developed by the American National Standards Institute rather than set its own, according to the report, has an obligation to develop federal standards when conflicting interests impede the voluntary standards process.

But even if NBS develops standards in the future, they will be of little value unless OMB develops an effective means of enforcing them, the committee said.

Agencies were also hit for their use of machine-dependent programs. Because more and more equipment decisions are being dictated by the wish to avoid costly software conversion, federal agencies should be required to write programs in high-level languages, the committee said.

Further, software conversion costs should not be considered in evaluating bids for procuring DP systems except to the extent that those costs involve direct out-of-pocket expenses for program conversion, the report said.

Another source of waste, the committee said, lies in the agencies' failure to effectively use the DP resources they have.

The Social Security Administration was cited as "the most flagrant" in this regard for "operating equipment at 50% capacity and running second-generation programs on third-generation equipment."

Under existing regulations, an agency that wants to handle its own procurement and sidestep the formality of bidding – especially when only one make and model will do for reasons of compatibility – merely requests a "delegation of procurement authority" from GSA. If the request seems justified, the GSA responds routinely.

The report, however, found GSA lacks the manpower and resources needed to examine in any depth a user agency's request for a noncompetitive procurement.

Because of its relatively low position on the federal totem pole, the GSA also tends to buckle under when agencies with greater "prestige" or "dominance" apply pressure in a procurement situation, the report said.

As a result, it grants agencies permission to obtain DP equipment by make and model rather than competitive bidding when it is not necessarily justified, according to the report.

While the Brooks Act permits agencies to specify their DP requirements, it does not allow them to specify brand names of equipment, the report said.

Kolence Software Physics Theory: True or False?

(Continued from Page 1)

calculated "software power" vector. In other words, the real workload is finished by the real equipment faster than the theory predicts.

Sound easy? Try it.

Surely someone can find a counterexample. Fortunately, searching will be productive and practical even if a real counterexample can't be found. The amount by which the corresponding vector elements of "software power" exceed "software work" in the appropriate period is a precise statement of a real configuration's efficiency relative to real workload.

For another view on software physics, see story on Page 19.

Most managers should be willing to support a thorough search for a counterexample to Kolence's theory if they understand the byproduct of this quest will be a set of consistent descriptions of how well-matched the equipment is to the various changes of workload overtime in their own environments.

Isn't this exactly the set of performance indicators every installation says it wants?

Kolence's theory does not deal with every computer-related problem. It only addresses those directly concerned with capacity management. But, in my opinion, it addresses these thoroughly and consistently.

It is hoped the arguments which must rage on the merits of his theory will aim at what Kolence has proposed rather than at what his work doesn't address. Those who are in the computer performance evaluation field must accept the burden of disproving (and maybe even proving) Kolence's theory.

It is fortunate that most in this field are open to new, perhaps heretical, ideas. The danger now – as is historically the case whenever a theory is proposed – is that the few with closed minds and open mouths may cause delay in the testing of the theory by those who prefer listening to thinking for themselves.

There are significant roadblocks to the widespread testing of the theory of software physics. Principal among these is the need to read and reread Kolence's very expensive book, *An Introduction to Software Physics*, and then attend a formal course taught by Kolence or one of his disciples to learn what the book tried to say.

Each who will test the theory must know the rather cumbersome notation and be willing to recall (or learn) the use of vector algebra to understand and describe the actions and reactions of this new physics. Then each must practice applying these notations and mathematics in formal exercises just like in elementary calculus or sophomore physics (of the conventional kind).

Clearly, this would be an ideal exercise for a campus, but Kolence chooses to risk using the theory in real applications first – to see whether the theory is right – before encouraging academics to use his ideas.

On the more positive side, software physics parallels Newtonian physics, not quantum theory or any of the modern physics. The terms are like "force" and "mass" without the perturbations of things like atmospheres or third bodies.

In this same vein, and at the risk of sounding too much like a dewy-eyed historian, I would point out the very young Isaac Newton proposed a theory for his peers to critique and was so badly maligned he never proposed another theory (some say he even refused to use the word) for the rest of his long life.

It is presumptuous to class Kolence's theory with Newton's. But who can say this is improper until the proofs have been made?

It is fitting a theory should be proposed so very early in the existence of our nebulous science of computers. Less than 30 years and already a theory?

It would be equally fitting if the theory turned out to be wrong, but wouldn't it be pleasant to be involved when the cornerstone of a real science was laid?

I'm sure I reveal too much when I admit I know Kolence very well and count him as a good friend. He is clearly the underdog in the coming contest and I don't really think he'll prevail.

But I hope that, if he loses, it's because some careful individual has demonstrated conclusively the theory is wrong, not because of some thoughtless individual who talks loudly.

Currently a consultant with the U.S. General Accounting Office, Morris emphasized he "has no past or present business connection with Kolence or the Institute for Software Engineering" although he has attended a week-long "Introduction to Software Physics" seminar.

That seminar is given by the institute, which can be reached at P.O. Box 637, Palo Alto, Calif. 94392.

Western Union Joins SP As Bidder for Datran Assets

ALEXANDRIA, Va. – Southern Pacific Communications Co. (SP), previous sole bidder for the assets of defunct Data Transmission Co. (Datran) [CW, Oct. 4], found some competition in the form of Western Union Telegraph Co. at the U.S. Bankruptcy Court hearing here last week.

As a result, the hearing will reconvene Tuesday to continue the bidding process, according to receiver Stanley J. Samorajczyk.

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Vserv is available on a 30-day free trial. The user guide is self-generated by the Genserv macro and the system is provided on magnetic tape.

Vserv is available for a one-time purchase price of $400. Occidental Computer Systems, Inc., 10202 Riverside Drive, No. Hollywood, Calif. 91602.

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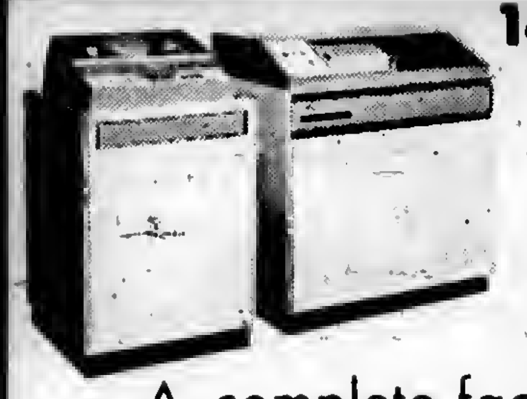

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Ex-Chief of OTP 'Disappointed' Houser Not Taking Strong Stands

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – It is a "great disappointment" to John Eger that the White House Office of Telecommunications Policy (OTP) has not taken a more positive stand on pending issues.

Eger, who stepped down as OTP director in July, said Thomas Houser, present OTP chief, is taking a more conservative approach in dealing with the Consumer Communications Reform Act of 1976, the Justice Department antitrust suit against AT&T and other communications issues.

Contrasting recent statements by Houser with his own stronger positions, Eger said in an interview last week that some of his speeches made in support of competition were "partially subjective." While some of these statements were regarded by others "as a crusade," Eger feels the director of OTP has a responsibility to speak out on issues.

Since OTP is an executive office of the White House, statements from the director may imply Administration approval. In actual practice, such speeches are often not cleared with the White House, he noted, and it may have been incorrect to assume White House agreement with some of his speeches.

The introduction of the Reform Act is part of a multifaceted program launched by the telephone industry to get a bigger share of the emerging data communications/data processing market, Eger said. Even if the present bill is not successful, the telephone companies are geared for a legislative effort that could take three to 10 years, he predicted.

If Bell gets only one part of the Reform Act proposals passed, it will have won, so it is essentially a "no lose" situation for AT&T, according to Eger, who is now with a Washington law firm.

When the Federal Communications Commission (FCC) first introduced competition, it should have known AT&T could not compete fairly under the rules spelled out by the commission, Eger said. Based on this inequity, "my gut reaction is that it ought to have something," he added, "and we cannot fault AT&T for asking for a hearing before Congress."

The current telecommunications questions now being considered by Congress will go well beyond the scope of the Reform Act; it is possible Congress will examine telecommunications capability as a national economic resource, Eger believes.

The Reform Act should be regarded as a de facto nationalization bill and a reaction to 40 years of technological progress being applied to a 1934 act, he said.

The FCC has done a good job, but with limited tools, he added.

While the issues raised by the Reform Act are pending, AT&T will continue to introduce devices that perform more data communications, and each device will look a little more like a business machine; it is probable that AT&T will get permission to get into DP in some way, Eger said.

House Unit Wants Act Rewritten

(Continued from Page 1)

Among the issues to be considered by the subcommittee, Margeson said, are whether the FCC has established fair competitive ground rules; whether business telephone services really subsidize residential services; and what the implications of changing FCC policies toward competition are.

In the area of economics, Margeson said the uniform system of accounts used by the telephone companies to report their activities to the FCC "is a turn-of-the-century method that is now almost totally useless."

The debate raised by the Reform Act centers on two main areas, according to Sebastian Lasher, assistant to FCC Commissioner Abbott Washburn. First, it seeks to determine who decides the scope of consumer equipment choice and, second, what criteria will be used to decide common carrier choices, Lasher said.

In the interconnection area, the remaining problems are technical since it has already been determined there is no economic harm to users. In the specialized carrier area, an economic question remains since it has been determined no technical issues are involved, he told the CLA members.

'Cartelization' of Industry

Several speakers took issue with recent FCC competition policies and said they were leading to "cartelization" of the communications industry.

The FCC has failed to plan for the economics of competition, according to William Malone, vice-president of General Telephone & Electronics Corp. It is "introducing competitors, not competition" and, as a result, the user is foreclosed from using certain services, he charged.

John Bartlett, a Washington regulatory attorney, said substantial innovation has taken place since the Carterfone decision and this in turn has increased the utility of the telephone network. As a result, both the independent equipment suppliers and the telephone companies have benefited, he said.

Competition is inevitable, so the only question left is how to regulate it. The FCC is drifting toward cartelization, and the user will be the loser, Bartlett said.

Herbert Jasper, executive vice-president of the Ad Hoc Committee for Competitive Telecommunications, told CLA members the telephone companies lobbying for the Reform Act are claiming basic telephone service is being offered "as a loss leader."

Actually, residential subscribers are subsidizing business users, Jasper said.

The FCC has already studied the basic issues raised by the Reform Act and refuted many of the allegations now raised by the telephone industry, he added.

In an earlier session dealing with the reopening of the Computer Inquiry by the FCC, Prof. Anthony Oettinger of Harvard University said the science and technology of computers and communications "are now indistinguishable."

One can no longer tell computer functions from communications functions and, since the segments are arbitrary, it will require political solutions to determine the boundaries between fragments of the system, he said.

"We may pay an exceedingly high price to keep computers and communications separated" and there have been no studies on what this cost would be, Oettinger said. The FCC is operating under a very "shaky mandate" and is bumping up against jurisdictional boundaries with the new definitions in the Computer Inquiry, he said.

Edward Goldstein, director of product management for AT&T, said Bell intends to provide integrated communications services to users. Such services within the data communications area will include functions like transmission, media conversion and communications processing, Goldstein said.

Within the communications processing area, the telephone company would control such capabilities as code conversion, terminal polling, error control, format control, signaling and switching, he said.

Questionable Foreign Payments Really Total $4.6 Million: CDC

By Molly Upton
Of the CW Staff

MINNEAPOLIS – The computer operations sector of Control Data Corp. (CDC) made questionable foreign payments in 12 countries totaling $4.6 million over a 10-year period, according to a report issued by a special committee formed by CDC to study the problem.

Previous reports from CDC had indicated the firm made only $2.3 million in questionable foreign payments during 1973, 1974 and 1975 [CW, April 12].

The committee also found a CDC subsidiary made questionable domestic political contributions of $1,415 in 1972 and 1973 and its Commercial Credit subsidiary made questionable nongovernmental domestic payments of about $41,000 over an eight-year period.

CDC said there is no change in its earnings outlook for the third and fourth quarter because the questionable payments during 1976 were not material.

Limited Basis

Although no questionable payment arrangements were entered into after March 30 and no such arrangements now exist, CDC did continue making payments on a limited basis between the beginning of the special investigation in March and a board of directors meeting early this month.

In accordance with a management directive issued in March, all existing questionable payment arrangements were discontinued unless that "would jeopardize company assets or employee jobs or safe-

ty in a particular foreign country," the firm said.

Under this interim policy, in effect since March 30, payments totaled about $689,000, CDC said.

Substantially all of the $4.6 million in questionable foreign payments seem to have been made to foreign government employees to obtain favorable treatment in securing or retaining business, according to the firm.

The value of orders thought to be associated with these payments approximated $75 million. CDC's computer business had 1975 revenues of $1.2 billion, about one-third from foreign business.

From July 1, 1966 through June 30, 1976, the computer business had revenues of approximately $7.3 billion. About 31% of this amount was from foreign business, CDC said.

FAA Foul-Up Affects First Lady

PALMDALE, Calif. – The Federal Aviation Administration's (FAA) computer-based air traffic control system, which has been plagued by outages [CW, Sept. 20], failed again last week while monitoring a DC-9 aircraft carrying First Lady Betty Ford.

Although the outage occurred when the aircraft was less than the prescribed safety distance from a single-engine Cessna, there was no hazard to either plane, according to an FAA spokesman.

The plane carrying the First Lady was 45 miles northwest of Los Angeles when it came within "three and three-quarter miles horizontal separation and 700 feet vertical separation" from the Cessna, he explained.

No evasive action was necessary, a second FAA spokesman noted.

An air traffic controller at the Los Angeles Air Route Traffic Control Center here was aware of the close proximity of the two planes and was carefully monitoring them when the system went down, the spokesman noted.

He declined to state how many other aircraft were on the controller's scanner at the time the controller was forced to switch from the computerized system to the manual backup.

However, the outage occurred during a normally "busy period" of air traffic activity, he said.

A congressional hearing will be held tomorrow on the outages which have occurred nationwide since the radar DP (RDP) system was first implemented by the FAA three years ago.

The inquiry is in response to work done by Rep. David Evans (D-Ind.) who began an investigation after a 45-minute power failure in the Indianapolis control center.

Two CPUs From Itel Compatible With IBM

(Continued from Page 1)

erating system. It is a multiprocessing configuration with two CPUs, 14 internal channels and a memory range from 2M bytes to 8M bytes.

The AS/5-1 runs under DOS/VS, OS/VS1, OS/VS2 and MVS. Processor cycle time is 115 nsec. It features seven internal channels and an 8K buffer. Minimum memory size is 1M byte; the maximum is 8M bytes.

The AS/5-3 runs under DOS/VS, OS/VS1, OS/VS2 and MVS. It has a 115 nsec cycle time and seven internal channels and features a 16K buffer. Main storage capacity ranges from 1M byte to 8M bytes.

The AS/5-1MP, which runs under MVS, is a multiprocessor configuration with two CPUs. It has fourteen channels, a 16K buffer storage capacity and 2M bytes to 16M bytes of main storage.

The AS/5-3MP, also running under MVS, is a multiprocessing configuration with 14 internal channels. The buffer store is 32K, and memory size ranges from 2M bytes to 16M bytes.

The systems cost "approximately 65%" of equivalently configured IBM systems, according to an Itel spokesman. For example, the AS/5-3 with 3M bytes of memory costs $1.6 million. The AS/4 costs about $800,000 with 1M byte of memory.

The systems are 25% smaller than the 370/158 and weigh 37% less than the 158. This is a result of high density emitter-coupled logic used throughout the CPU, Itel said.

The systems are also said to be 10% cooler than comparable IBM units.

The CPU logic consists of pluggable chips on removable boards that swing out on a gate. Air-cooling units are located at the bottom of each gate to cool the system.

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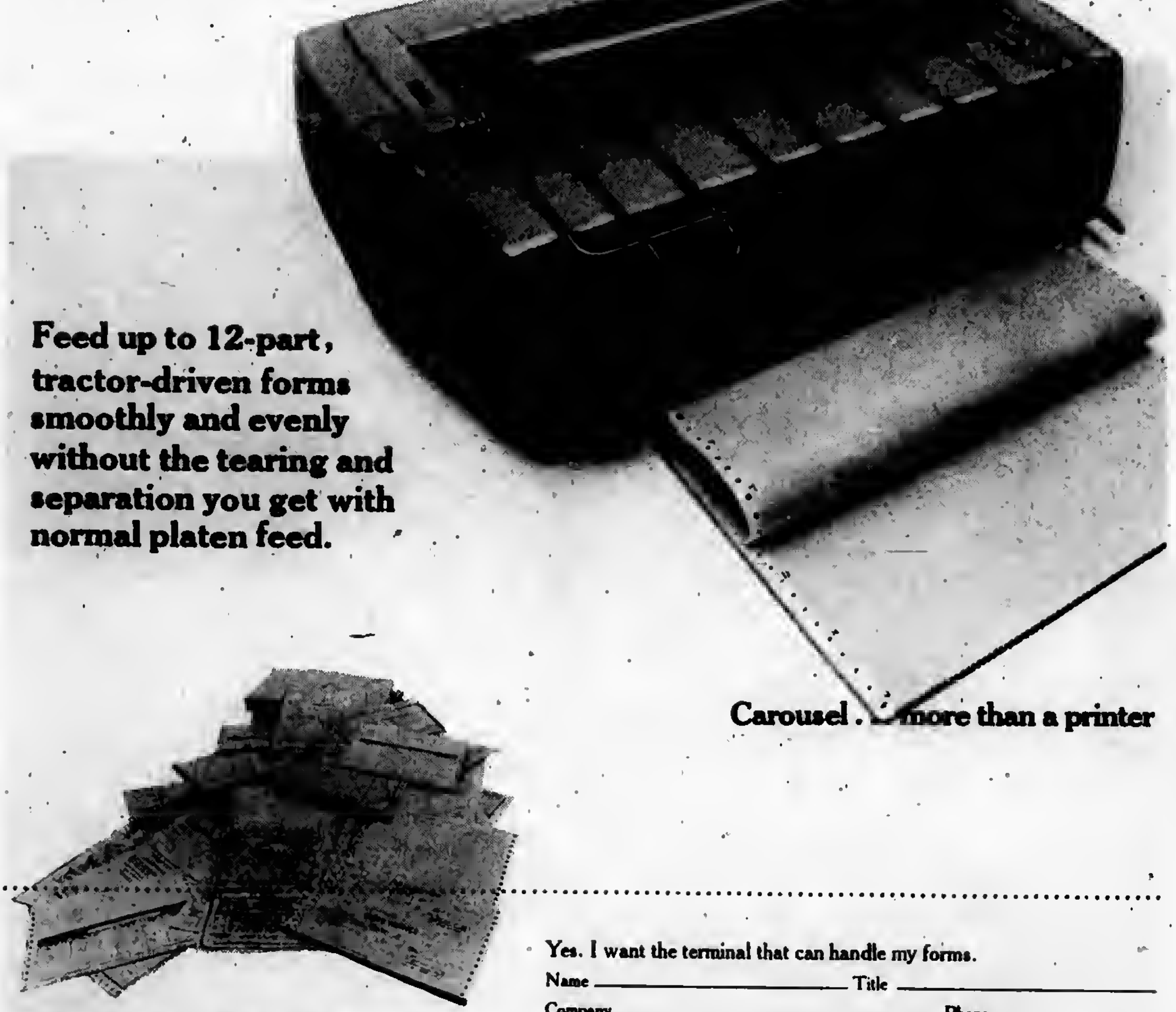

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Keynoter Also Cites Risk of DP

People Stressed as Vital Element of Retail Systems

By Toni Wiseman

Of the CW Staff

PHOENIX – People – be they management, systems personnel, users or customers – are the most critical element in a system, Donald V. Seibert told attendees of the National Retail Merchants Association's (NRMA) annual DP and Data Communications Conference here last week.

Seibert, chairman and chief executive officer of J.C. Penney Co., focused his keynote address on the concept of putting people before technology, something he said is not new to retail management.

The ability to serve customers efficiently and effectively in the future will depend to a large degree on the retailer's expertise in the areas of data base management, management information systems and optical character recognition, he said.

But from a wider view, "the most critical element in any successful system is people – from the console operator to your chief executive officer. I also mean the people our systems help us serve – our customers," he said.

While the chief executive officer can't be involved in all projects, he must provide leadership in planning and overall objectives, Seibert said.

Above all, the chief executive officer must understand what systems can do for him and his company, he said. He must know the information systems provide the means he needs "to develop competitive advantages over other companies," he stated.

Systems, used intelligently, can increase efficiency and reduce costs of distribution, making it possible for a retail establishment to offer its customers better value than its competition, he said.

CW At NRMA

"Whatever name you may give it, the subject of people comes down to management development, training and involvement in systems" he said.

Today's DP systems are more than ever at the heart of the retailing business, but "as our dependence upon systems grows and as they become increasingly complex, we must anticipate more risk," Seibert said.

When the computers in the catalog distribution centers go down, the centers go down right along with them; when the lines on the credit authorization systems go down, so does credit authorization, he emphasized.

The evaluation of such risk, the additional costs involved in minimizing such risks and the weighing of various alternatives require the highest level of management attention, he said.

"The executive who describes these decisions as 'systems decisions' either doesn't understand their importance or doesn't understand his or her management obligations. It is the obligation of systems people to be sure the issues are clearly defined, clearly understood and assigned a high enough priority," Seibert stated.

These decisions must be reached in a framework of partnership between the systems implementor and the systems user, Seibert said.

Both must have a sense of authorship, but the user requires something else which is extremely important – pride of ownership. The system must belong to the user, not to the systems department or to the supplier, he stressed.

"This pride of ownership will often make the difference between success and failure of the system. When you boil it all down, there is no system . . . that will be effective unless the user really wants that system to work," he stated.

Systems people, he noted, bring with them the systems approach to problem solving, not a computer approach but a productivity approach. Systems work is usually, if not always, related to the improvement of productivity, the most important issue currently facing retailers, he explained.

And while productivity of space, for instance, is important, the individual productivity of people is even more so.

"When you improve the quality and speed of information, you improve the decision-making process and the productivity of people. I don't know any group within a company that's more involved in this basic approach to productivity than the systems group," he said.

Retailers are now at the forefront of systems technology, he said. The retail industry has made many demands upon the technology of systems and systems people have responded, he added.

Many of the innovations in communications, optical scanning and minicomputers have been sparked by the needs of retailers, he noted.

"Whenever a system comes into conflict with the wants, needs, hopes, aspirations and personal freedoms of people, the system must be changed immediately, changed as necessary, and sometimes – impossible as it may seem – scrapped entirely," ~~he stated.~~

AT&T Granted Extension For Response to Wyly Suit

NEW YORK – AT&T has until Nov. 22 to prepare its response to the antitrust suit filed against it by Wyly Corp.

The date extension was stipulated by both parties, according to an AT&T spokesman. AT&T's reply was to have been filed before Oct. 1.

When Wyly announced its decision to abandon its Data Transmission Co. (Datran) operations, it also filed suit in the U.S. District Court in Washington, D.C., seeking $285 million in damages from AT&T for allegedly keeping Datran out of the data transmission and digital data transmission services market in violation of antitrust laws [CW, Aug. 30].

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In Scientific Market, Trial Shows

IBM Wooed Two Large Users With Nonexistent System

By Catherine Arnst
Of the CW Staff

NEW YORK – Evidence in the U.S. vs. IBM antitrust trial hes told the story of two users who were wooed by tales of an IBM system that did not yet exist and never would exist with the capabilities the corporation had promised.

In 1963, Bettis Atomic Leboratory and Knowles Atomic Laboratory, both operated for the U.S. Nevy's nuclear submarine program, decided they wanted two large, fast scientific computers that would be competible with eech other.

A series of discussions were held with Control Data Corp. and the firm's 6600, announced in April 1962, became the leading contender for Bettis' and Knowles' scientific workload.

The 6600 was faster than anything else on the market at that time and its architecture, cooling system and circuitry design was unique, Robert Schmidt, CDC executive vice-president, testified recently. Delivery was set for mid-1967, he added.

IBM, however, began to notice CDC's growing dominance in the large scientifio computer merket at that time and did not plan to lose what it considered a prestige market, trial documents indicated.

At a meeting in Jenny Lake, Wyo., that year, IBM executives began to plan e series of machines that couid compete with the 6600 in that marketplace [CW, Aug. 23].

IBM rushed plans for the 360/90 after it lost e bid to CDC from the U.S. Weather Bureau, documents showed. The Weather Bureau had chosen CDC's 6600 over two IBM 360/70s coupled with parallel disks beceuse it was faster, cheaper and could be delivered sooner, Schmidt testified.

IBM management was alreedy having difficulties with the Model 90, documents indicated. A memo written to IBM Board Chairmen Thomas J. Watson in October 1963 warned the Model 90 project might not necessarily put IBM in e position to bid competitively.

In spite of that, however, no effort was spared to hold the scientific market pending the outcome of that project.

Bettis and Knowles became victims of this stretegy, the documents indicated. At first CDC had been confident it would win the contrect because its 6600 was faster than enything IBM had at that time.

However, in 1964, CDC began getting indications from its discussions with the labs that IBM was promising something better, Schmidt testified.

The labs wanted a guarantee that e faster follow-on computer would be forthcoming, Schmidt testified. However, CDC had not yet announced its 6800 and wes reluctant to promise a machine it did not have.

IBM, however, did not feel reluctant about promising the Model 91, which had just been announced without complete product tests and an overly optimistic delivery schedule, the documents said.

IBM executive Paul Naplen described its design es "shooting an arrow into a wall and painting a bull's-eye around it," trial documents said.

In late 1964, Bettis and Knowles told CDC they had decided to go with IBM's offer of two 360/75s, presumably with two Model 91s to be delivered shortly thereafter, according to Schmidt.

The effects of rushed planning for the Model 90 series began to wreak hevoc with IBM's production schedules, which continued to slip, according to Robert Desio, who was at that time IBM's manager of scientific marketing.

Sales restrictions had to be placed on the 91 and Bettis and Knowles decided to reopen negotiations with CDC.

The labs still wanted promises of a fester follow-on computer, however, end put pressure on CDC to give them that promise. CDC was desperate for the order because the mainframer had not received any orders for the 6600 since the initial four more than e year earlier, Schmidt testified.

In its original bid to Bettis end Knowles, CDC had quoted e price of $6 million for each 6600. However, by 1965 it had cut its price for the 6600s end two follow-on 6800s to a total cost of ebout $7 million.

Schmidt acknowledged this huge price cut was made partially to combat the intense competitive pressure It was feeling from IBM, which was et that time flooding the scientific market with salespeople in an attempt to hold the market.

Unfortunately, the two labs egain found themselves in the situation of expecting a system that could not be delivered. The 6800 wes not turning out as planned, and CDC decided to "fece the music," Schmidt testified.

It went to the labs with the proposal that they drop their expectations for the 6800 and insteed eccept the 7600 when it was ready, Schmidt said. The labs agreed.

As for the Model 91, only 15 systems with that designetion were ever delivered, testimony indicated.

Players of N.Y. Lottery Assured Duplicate Ticket Codes Routine

ALBANY, N.Y. – Despite reports that duplicate numbers had been found on winning $2 and $5 Empire Stakes instant lottery tickets, duplicate validation codes are epparently routine and cause no problem, according to John Quinn, the lottery's director.

The New York Stete lottery system was resumed recently after e totel reorganization; ticket sales hit record numbers from the outset [CW, Sept. 27].

The validity codes, printed for ticket vendor use, were duplicated as a convenience to vendors in checking winners in the game, Quinn said.

No effort is made to prevent duplicate validation numbers in this lottery or in any state that uses an "instant" lottery system, he said.

"The Important thing," Quinn pointed out, "is that the prizes are paid on the dollar amounts printed under the six wax spots, not on the validation numbers.

"Judging from the level sales are maintaining, New Yorkers are having fun with the game and have confidence in it. The design of the game is good and the tickets are secure," he said.

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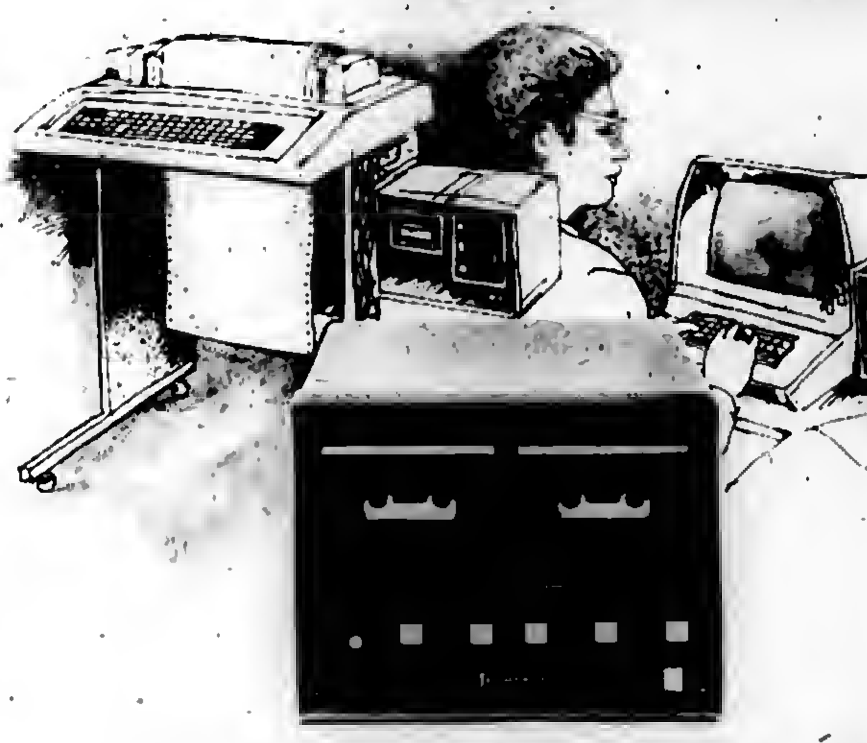

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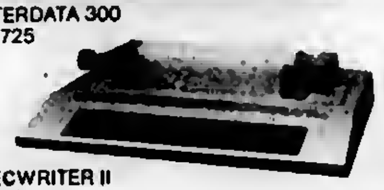
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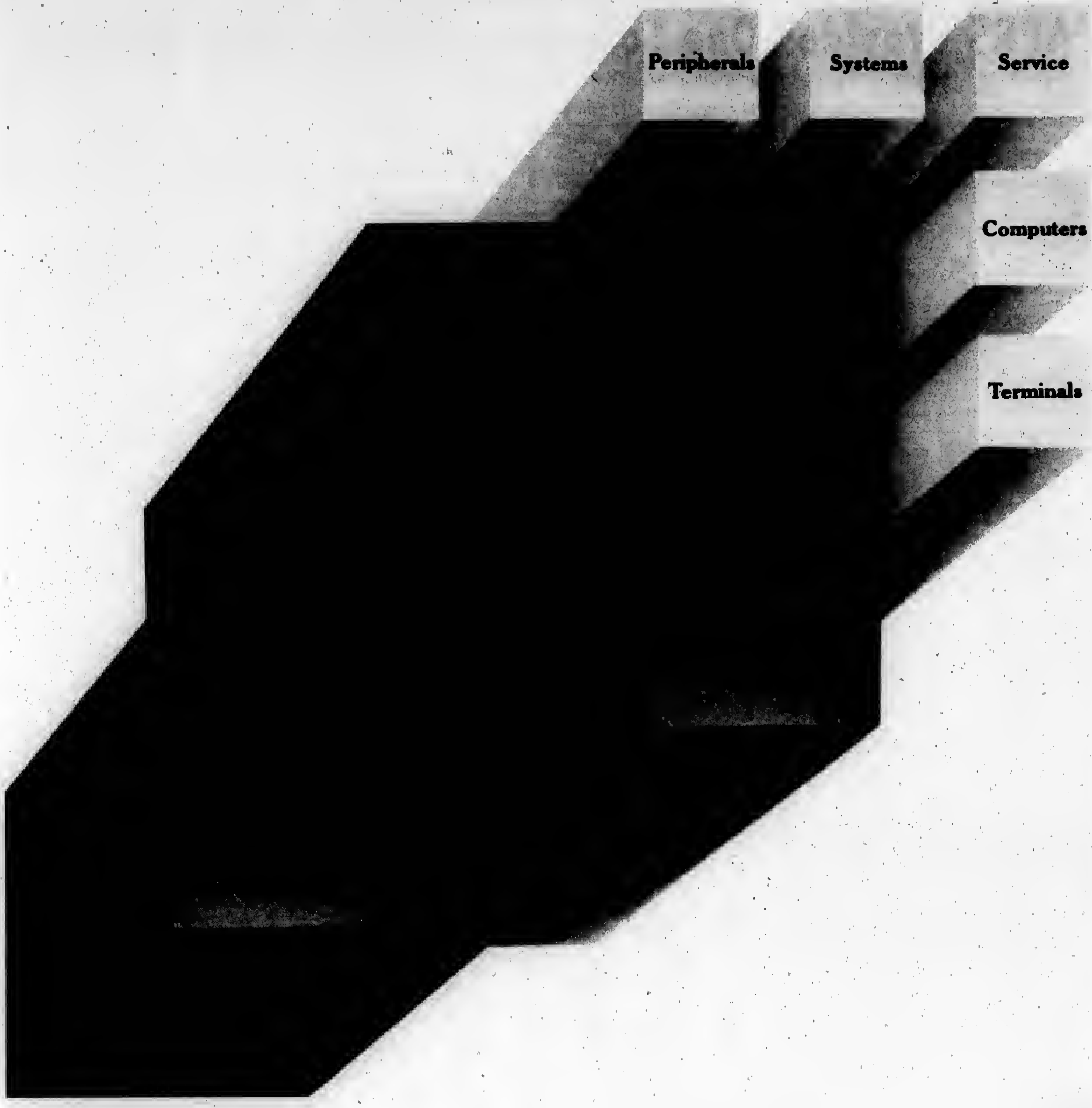

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FAPRS Provides One Source of Data on Federal Funds

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. – "Welcome to FAPRS: You are using a unique, self-teaching question-answer type of automated system which is designed to give rapid access to federal domestic assistance loan and grant program titles according to your needs and the information you provide . . ."

So begins the printout for the Federal Assistance Program Retrieval System (FAPRS) designed and developed by the U.S. Department of Agriculture's Rural Development Service.

Until recently, Congress was considering making FAPRS the basis for a single, national information system on federal assistance programs, and the General Services Administration was testing the system at four of its federal information centers across the country. However, the project has been tabled until after the new Congress meets in January [CW, Oct. 11].

Developed during 1975 and operational last March, FAPRS scans a data base of more than 600 funded federal domestic assistance programs and prints out a list of those funds for which an inquiring community appears to qualify. Included are funds for community facilities, housing, business and industrial development and planning and technical assistance, according to Paul R. Kugler, director of the Rural Development Service's Plans and Programs Staff.

Alternative to Manual

FAPRS represents an alternative to the *Catalog of Federal Domestic Assistance*, the manual of federal aid to state and local governments published since 1965.

Because FAPRS gives users a tailored list of only those programs for which they seem to qualify and which have been funded by Congress, the system goes several steps beyond the 1,100-page catalog, which simply details some 1,000 sources of federal funds, Kugler said.

In addition, the catalog is usually four months out of date, he noted. The automated system can be updated as quickly as changes are made in a program's description, funding or eligibility requirements.

FAPRS has the added advantage of being cost-effective, Kugler indicated. A manual search for the right grant or loan can take as long as 40 hours and cost as much as $250,000; the automated system can do the same job in 10 minutes for $6, he explained.

The only hardware a user needs is access to a terminal that is teletypewriter-compatible, has an acoustic coupler, operates at 300 bit/sec in half-duplex mode and has a printer to provide a hard copy of the program information, Kugler stated.

Users may access FAPRS through one of two time-sharing firms licensed by the Department of Agriculture to carry the service: General Electric Information Services and Service Bureau Co.

The cost of the system to the Agriculture Department thus far has been less than $30,000, and Kugler believes the system will break even on a yearly basis if it is used 18,000 times.

With a current average of 4,000 runs a month, he isn't worried about the financial aspects of FAPRS, he said.

System In Wide Use

Currently operating in 46 states through the Department of Agriculture's extension service, FAPRS has also been adopted by 10 state governments and by the Department of Health, Education and Welfare (HEW) in its regional and Washington offices.

The Old West Regional Commission is also using the system; the Library of Congress runs it for members of Congress. The House Information System – a 30-terminal test project currently going on in the House of Representatives – will soon offer FAPRS as one of its services, Kugler said.

Kugler and his full-time staff of five took the initiative for the development of this information system in December 1974 because they wanted people in the most rural and the most urban areas of the country to have equal access to information about federal funding.

During the summer of 1975, four "very dedicated" interns assigned to Kugler's staff did the basic research on all the federal assistance programs available. Lifting only the number and title of each program from the *Catalog of Federal Domestic Assistance*, they developed the rest of the information through interviews with each federal program manager.

That fall, Kugler's secretary, Norman Weetman, now data research and management assistant for Plans and Programs, wrote 30,000 lines of code with fewer than 50 errors and no formal DP training, Kugler said.

The system was operating by Jan. 6 of this year, and Kugler and his staff used a Hazeltine 2000 system with CRT, printer and tape cassette unit to test it.

In building data on the cassette unit, however, they discovered Hazeltine couldn't tell them how to interface the device to the time-sharing networks licensed to carry FAPRS. So the Plans and Program Staff developed its own interface protocol for the cassette unit and will make that procedure available to anyone who wants it, Kugler said.

FAPRS was formally announced on March 12, and Kugler described its reception as "tremendous." Today, his office averages 20 letters and 100 phone calls on the system each day.

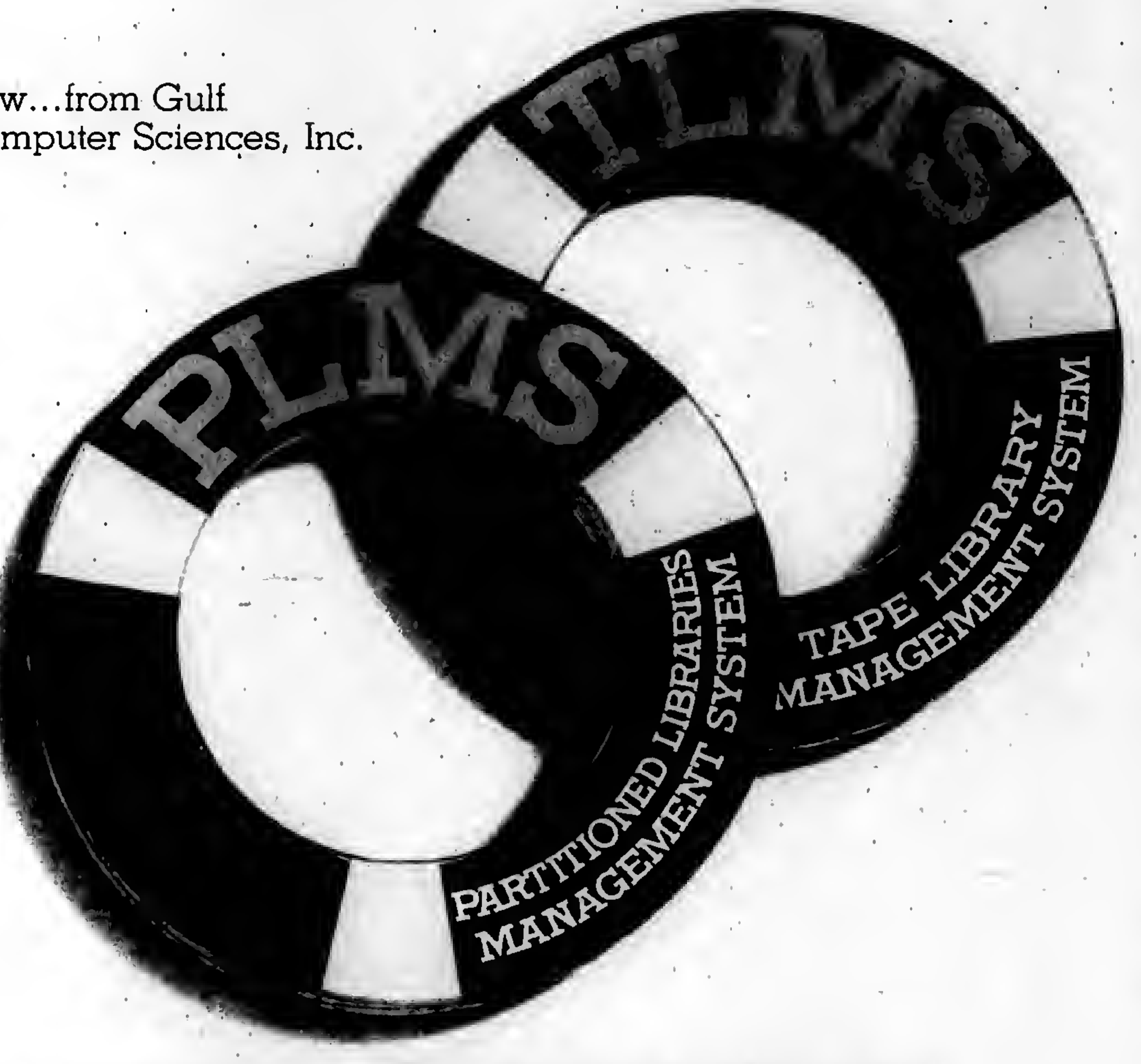
Despite the recent setback in his goal to make FAPRS the basis for a national federal assistance information system, Kugler intends to go on with plans for a doubling of the categorical breakdown of federal programs contained in the system.

By February 1977, he hopes to have added education, employment, health and social services breakdowns as well.

Such entries will appeal to new markets like schools and hospitals, many of which already have terminal capability.

The enthusiasm for FAPRS extends beyond Kugler's staff and the Department of Agriculture. HEW, the Labor Department and the Community Services Administration have loaned personnel to add new programs to the system.

Kugler is pleased by this "high degree" of cooperation within government. "We need people who will move into the role of looking at computers from the point of view of the consumer," he said. "It takes a different kind of mentality to develop a system that anyone can run and that doesn't cost very much."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Developed After '73 Embargo

Modeling System Helps New England Cut Energy Use

By Nancy French
Of the CW Staff

CAMBRIDGE, Mass. – The six New England states individually and as a region are using a sophisticated energy model operated jointly by MIT and IBM's Cambridge Scientific Center to help cut energy costs and plan for emergencies.

Developed in response to the oil embargo of 1973, the system was put on display at a recent conference on the MIT campus here, where it was discussed by John J. Donovan, associate professor of management sciences at MIT's Sloan School of Management and a principal designer of the system.

Donovan, who noted 70% of the region's energy comes from petroleum products compared with 45% for the nation as a whole, credited the New England Regional Commission (Nercom), a cooperative planning organization, as the umbrella agency under which the system is operated.

Simulates Dedicated Computers

The New England Energy Management Information System (Neemis) was designed to take advantage of the best programs and data bases available on any given energy problem. However, so far only IBM operating systems can be run on the system, Donovan said.

Its computational capability is based on IBM's Generalized Management Information System (GMIS) which uses the Virtual Machine Facility (VM/370) to simulate several dedicated computers on one system, he said.

Experimental software written by IBM and MIT permits the various simulated, or virtual, machines to communicate with each other.

The hardware consists of one IBM 370/158 with 2M bytes of main memory and 100M bytes of secondary storage on 2314 and 3330 disk drives. Planners in state energy offices using IBM 2741 console typewriters, some IBM 3270 CRTs and some Hazeltine CRTs are tied to the system by dial-up telephone lines, he explained.

However, the system manages five virtual machines executing different user-oriented programs. Among them are several text editors as well as Troll, an MIT-developed econometric language; TSP, an IBM experimental econometric language; E/Plan, an IBM econometric language embedded in APL; and PL/1.

It also simulates four virtual machines executing different data base languages, including Sequel and Query by Example, two IBM experimental relational query languages, as well as GIS and IMS, two commercially available IBM products, Donovan explained.

In addition to allowing models and data bases to communicate with each other on one computer and allowing programs to be transported from one computer to another, Neemis allows multiple groups working on the same problems to access the same data base, Donovan said.

GMIS architecture also allows decision makers to access and maintain data on several different data base management systems. Since answers often are needed quickly, and there is no time to transport these data models to a common system, GMIS allows multiple modeling and analytical systems and data bases to exist simultaneously, he said.

Because it is impossible to know precisely what data will be needed to cope with a specific problem, Neemis was designed to enable its users to quickly assimilate new data and then validate and integrate it into a readily accessible pool of information, according to Donovan.

Three types of data are presently on hand. The first is fuel supply characteristics and includes inventory, storage capacity, fuel flows, contracts and domestic vs. foreign fuel sources.

The second, energy demand characteristics, includes variables like fuel consumption by geographic area and selected historical and projected economic data, such as gross national product, interest rates, weather data and selected historical and projected population, housing and weather data.

The third type of data concerns constraints on air and water quality standards, entitlement programs, decontrol measures, legislation and Arab embargo information.

To date, Neemis has saved the state governments of this highly oil-dependent region more than $500 million in oil import fees and enabled them to develop effective energy conservation policies, Donovan said.

By running simulations of its public buildings on Neemis, Massachusetts has saved its taxpayers about $10 million in heating bills, according to Lt. Gov. Thomas P' O'Neill III.

In addition, the system has told policymakers New England homeowners can reduce energy consumption 11% by installing storm windows. Storm doors save 4%, he said.

Further, upgrading to a more efficient oil burner results in a reduction of approximately 9% in fuel consumption, according to Donovan. However, since it takes the typical homeowner five years to recoup the cost of a new oil burner and the average New Englander spends only five years in a house, policymakers will have a hard time selling homeowners on the idea of buying new oil burners. Thus planners know they cannot expect to actually save energy consumption here, Donovan explained.

And on Sept. 17, when the *Wall Street Journal* reported rumors of a 10% increase in oil prices by the Opec nations, Neemis staff members were able to project the hike would cost New England residential consumers an additional $88.8 million, commercial users an additional $110 million and industrial consumers an additional $71 million, Donovan said.

Finally, in response to the energy embargo of 1973, New England homeowners turned down thermostats and reduced consumption of home heating oil by 13%. However, because price is now the only deterrent to unnecessary consumption of energy, New Englanders haven't done so well, the model has shown recently.

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Editorials

Keep the Questions Coming

The Office of Telecommunications Policy (OTP) is part of the White House Executive Office. And when the OTP director pays a visit to the Justice Department, it is assumed questions are being asked in the name of the Administration.

That's all wrong, according to OTP Director Thomas Houser. He contends his visit to Justice shortly after he was appointed to his present post was simply a fact-finding expedition to gather background about the government's antitrust suit against AT&T.

Rep. Timothy Wirth (D-Colo.) disagrees. He feels Houser's visit borders on political interference by the Administration, as he has told Houser in a letter [CW; Oct. 11].

Wirth pointed out Houser was a partner in a Chicago law firm, Sidley and Austin, that still represents AT&T in the case. Wirth feels this previous position could color objectivity.

Officially, OTP stated the Administration has taken no position on the AT&T antitrust suit, which has gone virtually nowhere in the two years since it was filed.

Presumably the White House (and OTP) would welcome the antitrust suit and the often-ignored Justice Department antitrust staff might get some much-needed support. Instead, the Administration says nothing. And its presumed spokesman, Houser, visits Justice after expressing doubts about the economic foundations on which the suit is based.

Houser can't have it both ways. If he has no interest, he should stay away. If he wants to take a position, he should come out with a clear-cut statement that represents both the White House and OTP. His predecessor, John Eger, gave strong OTP support to the suit.

Instead Houser implied he has some kind of passing interest in this case. But, Donald Baker, Assistant U.S. Attorney General, is reluctant to show Houser too many documents related to the suit.

Baker has a good point. Who knows how much of the information Houser gathers is staying within OTP? And more importantly, how did someone like Houser, with entangling former alliances, ever get appointed and confirmed as OTP director?

Wirth should keep on asking questions.

A Step Backward

The new tax bill permitting states and local governments to use the Social Security number (SSN) as an identifier for administrative purposes [CW, Oct. 11] shows once again that privacy advocates cannot rest in their efforts.

The provision was not well thought out and was added to the tax measure almost as an afterthought. While there was some debate over the issue, the item was essentially buried within a huge bill covering many important subjects and this item never received the discussion it deserved.

Previously, when the use of the SSN as an identifier had received proper debate and discussion, Congress wisely ruled out the use of that number for such purposes.

Privacy advocates in Congress and outside should make sure there is proper debate and discussion when issues are taken up affecting our privacy.

Such important issues as the use of the SSN as an identifier should not be tacked onto other bills.

Mr. Supermarket Manager Moves Boldly Into the Point-of-Sale Electronics Age

Letters to the Editor

Offensive Advertisement by DG Inconsistent With High Standards

The Sept. 20 issue of *Computerworld* included a full-page advertisement by Data General Corp. (DG) which is not consistent with CW's usual high standards.

It is offensive to myself (and other readers with whom I have discussed it) for the following reasons:

- The "mother" seemed, at first glance, to be the only female in that picture. To reference a female colleague as "mother" lacks consideration – just as it would be inconsiderate to label a male employee as "father."
- Later, it became apparent the computer is the "mother." This is a misnomer and a disparaging use of an English word. Definitions of "mother" usually refer to "female," "reproductive," "nurturing," etc. Certainly the computer qualifies in none of these respects since it is inanimate.
- It is a sexist label. I seriously doubt CW would print "Your father needs help." And, of course, it would be no more (or less) accurate.

Please restore my confidence in CW by dropping or changing the advertisement.

Robert D. Tennyson

Minneapolis, Minn.

A Bunch of Elitist Claptrap

Herb Grosch's column titled "Sunk in Steerage" [CW, Oct. 4] was a bunch of elitist claptrap. I'm glad I had my boots on when I read it.

Herb, I don't give a damn what or how you want to eat or how you want to fly. Just don't force me to help pay for it.

You're not worth it.

Dave Blanchard

Santa Clara, Calif.

In a Former Age of Bigotry...

In a former age of bigotry, would Herb Grosch say the colored should sit at the back of the bus?

John T. Connelly

Wilmette, Ill.

Emphasize Fact, Not Fiction

How long must it continue? First Kenniston W. Lord Jr. and now Alan Taylor [CW, Sept. 6]. The Los Angeles City check theft was not a computer crime. To refer to it as such is a patent fabrication.

Both Taylor and Lord should devote less time to using fictitious events for justifying their opinions and try to report facts instead.

Only when those in the DP field admit their computers are nothing more than glorified adding machines will they begin to become professionals.

Andrew H. Olson

Sunnyvale, Calif.

A Challenge to Respond

In response to the references made to the negative reaction to Ken Kolence's methodology by Barry A. Stevens [CW, Sept. 20] and Roger P. Novach [Oct. 4] in their respective articles on "Software Physics," I offer the following:

"... The structure [of software physics] remains as a challenge to them to present their own positions in an equally rigorous form." (From the preface of *An Introduction to Software Physics* by Kenneth W. Kolence.)

John Bennett

Baltimore, Md.

Data Past

Five Years Ago
Oct. 20, 1971

SANTA CLARA, Calif. – Memorex introduced the first complete IBM 3330 replacement system with a plug-compatible drive. The 3670 disk storage system included a 671 controller with up to eight 670 drives and had an average access time of 27 msec compared with the 3330's 30 msec.

– – –

VERO BEACH, Fla. – IBM announced it was ready to buy operational programs from outside users for resale under license to other users. The company established a class of software called Installed User Programs (IUP). The IUPs covered as wide a range of CPUs and uses as the Field Developed Programs (FDP) and were available under the same "ground rules" of limited cost to the user and limited support from IBM that separated FDPs from IBM's standard Program Products.

Eight Years Ago
Oct. 16, 1968

WELLESLEY HILLS, Mass. – Honeywell, Inc. introduced four competitive disk drives for direct access and mass information storage, four small disk-oriented computer systems and four disk packs. Type 278, the top of the disk drive line, was designed to compete with the IBM 2314; the Type 275 was meant to compete with the IBM 2311.

– – –

NEW YORK – The Association of Data Processing Service Organizations (Adapso) announced it would expand its membership to include software firms. A previous restriction that an organization "maintain physical control of and prime responsibility for its data processing equipment, facilities and methods" was dropped.

DPMA Continues Its Ostrich Stance on Certification

. . . And in This Corner

By Kenniston W. Lord Jr.
Special to Computerworld

Continuing its "head in the sand" stance, the Executive Council of the Data Processing Management Association (DPMA) has, for the second consecutive year, produced a two-page publicity release supporting voluntary certification, but opposing certification or licensing legislation.

My, but it takes a lot of courage to take a public stand against an idea more than two years after the idea has been advanced and more than a year after the idea has been soundly defeated, if "defeated" is really the word to describe it.

Quoting from the press release: "The [DPMA] supports the concept of voluntary certification as *a* valid and useful way to recognize expertise and professional attitude in the field of 'Information Processing' and reaffirms its support of the [Certificate in Data Processing] 'CDP' as the most appropriate certification program currently available."

I was the one who emphasized "a," for I would like my readers to note that DPMA did not say "*the* valued and useful way to recognize . . ." It's important to note that oversight, for the Executive Council of DPMA isn't about to take any stand which would cause its "beginning to dwindle" membership to be critical, particularly those who do not hold or who do not revere the CDP.

It should be noted that only a year ago DPMA was advertising it represented more than 22,000 members. This press release indicated a loss of 2,000 people.

Measure of Expertise . . .

It is amusing to note DPMA supports the CDP as a measure of expertise and professional attitude, for DPMA has waffled on those issues for years, particularly when the program, which was losing money in huge sums, was under its control.

In print, early DPMA President Billy Field thanked participants for their contribution to professionalism. In person, then-Education Director Don MacPherson stated professionalism was never the intent of the CDP program.

When the program was turned over to the Institute for Certified Computer Professionals (ICCP), then-Chairman of the Certification Council Erir Ustad, CDP, stated the objective of the exam was to attest to the knowledge needed by a DP manager.

Nobody, but nobody, including the board of directors of the ICCP, has ever indicated the CDP is a measure of expertise and professional attitude. And to state it is "the most appropriate certification program currently available" is somewhat akin to saying the sun will rise every morning. Once again, the status-quo organization has played it safe.

The publicity release continued: "DPMA further believes that a method of self-regulation, based on a specified set of standard practices and ethics, is the logical next step in the growth of our profession and the protection of the public interest, and we state our willingness to aid in the development of such standards and regulation method."

Beautifull Yes, DPMA, it is the "logical next step" and one that is overdue by at least 10 years. How come you are just now awakening to the problem? Did you finally recognize you can no longer duck the issue?

Did you finally recognize licensing is not now – nor was ever – the real issue? If you did, why do you cloak your publicity in the garb of an outmoded argument? If you did, why is licensing a prime topic on your Las Vegas agenda?

Let's be realistic, folks. Standards, as we have "practiced" them, have been great for the hardware and software vendors, but they weren't very effective for Frank Booth and Steve Karagianis.

A national mandatory standard must be developed, sort of a Uniform Code for Data Processing (UCDP). And the procedures necessary to implement and enforce such a standard must be put in place, soon.

The concept of voluntary certification and self-regulation has been with us since the beginning and it has never worked. Yet the DPMA Executive Council, the DPMA organization at large and perhaps other organizations as well continue to bury their heads in the sand, convinced the issue will go away. It will not.

Interestingly, the DPMA Executive Council continues to sit on both sides of the fence, as its press release went on to state "such self-regulation should be designed to facilitate the administration of a licensing procedure."

Thus, while unwilling to take the leadership to develop mandatory standards and licensing procedures, it is nonetheless willing to admit the inevitability of such occurrences.

But then the crunch finally came. DPMA stated, "DPMA, however, is opposed at this time to the enactment of legislation which would require certification or licensing as a legal necessity for employment, operation, supervision or management of any area of endeavor within the field of information processing."

What a caveat! How come you didn't extend your caveat to cover the public, DPMA? Why don't you send a copy of your press release to Frank Booth's widow? Or to Steve Karagianis' mother?

And DPMA's coup de grace is this: "DPMA directs attention to the principles espoused in our organization's Code of Ethics and Standards of Ethical Professional Practice regarding individuals' rights of privacy and calls upon information processing practitioners [note that it did not say "professionals"] to follow these principles, in the best interests of the profession and of society."

Such a rousing finale is to be expected of DPMA. It has said "everybody ought to do right; ought to do good, decent, honest and ethical things." Reality, however, indicates otherwise. And even DPMA cannot continue to bury its head in the sand forever.

There is a world of difference between a public suspecting it is protected at the hands of well-meaning entrepreneurs and of its knowing, beyond the shadow of a doubt, such protection exists. You didn't do it again this time, DPMA, and you have continued your quarter-century tradition of avoiding the issue.

And you, my readers, many of whom are DPMA members or members of organizations which have adopted equally strong stands, do you see what your leadership is doing? Do you see where it is leading you? Will you be prepared for the backlash?

Those of you headed for Info/Expo Las Vegas have a golden opportunity in your hands, an opportunity to let DPMA and the entire information-processing industry know, in no uncertain terms, the issue is real; it is vital to the development of the industry; and it can no longer be ignored.

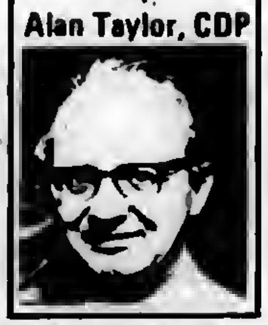
Justification for Overbooking Based on Brittle Data

"Brittle" data is something which few DPers really worry about – unless they are statisticians. Brittle data is that item which appears to be both studied and correct. It is used until something better comes along or, more dramatically and more usually, until something happens to make its validity suspect.

The Taylor Report

By

Alan Taylor, CDP



A rather good instance of brittle data which came to my attention recently was the argument that the overbooking practice was necessary; otherwise, the airlines would have to increase their fares substantially to make up the difference in revenue. According to United Air Lines, the amount was about $50 million/year for that airline alone.

Fifty million dollars is a substantial sum. The argument appeared to match the 1967 Civil Aeronautics Board (CAB) ruling that recognized the value of overbooking practices to the traveling public.

At that time, the CAB stated the following: "In our view, any realistic appraisal of the practice of overbooking leads to the conclusion that, while it results in oversales, it also contributes to flexibility and freedom in securing, changing and canceling reservations.

"Thus, any rigid controls over overbooking, as now practiced, would reduce load factors and the additional cost would ultimately have to be borne by the traveling public."

In light of the above, it can be seen that the present reservations systems of the airline carriers generally benefit the traveling public.

Everything in the garden was rosy. In considering ovetbooking, this assumed loss of revenue was a major point in my mind – until I found the basis for that $50 million/year figure from United.

The basis follows: "The value of the Space Planning program (which authorizes the overbooking and sets limits) is clearly evidenced by its performance record. In 1974 and 1975, United's Space Planning created a total of 1,997,285 which would not have been available if overbookings were not permitted.

"A total of 1,559,062 passengers were given confirmed reservations and accommodated in these seats of the flights of their choice during this period. Using the 1975 average fare paid of $63.65, these 1,559,062 passengers contributed $99,233,296 in revenue, much of which would otherwise have been lost."

Now the picture is different. In detail, the original claim of $50 million/year isn't even there; rather, the claim is made that much of the $99,233,296 would have been lost. However, no idea of how much is given.

The $50 million can now be considered brittle data.

Life Cycle of Brittle Data

Originally, the use of the figure, or its equivalent, was to bolster the idea overbooking was valuable and had been studied in detail. This is similar to the positions taken by many DPers who argue in favor of the performance of various computerized projects. It is one which often wins by reducing the argument to its simplest grounds, as the overbooking argument did in the 1967 CAB ruling.

Unfortunately, because the basic data is brittle, it becomes embedded in the system, almost as dogma. Later, it can begin to show its own weakness and much more.

For instance, the United statement indicated not only that the $50 million/year isn't a valid picture but, at best, United has not yet studied the problem sufficiently to come up with any reliable evaluation.

At worst, of course, is the idea it has studied it, knows the real answers and dares not publish them because they disprove the basic claim.

Elementary Factor Ignored

The lack of study on United's part is based on the fact one elementary factor is totally missing and is being ignored. Such ignoring of the factor would not have occurred if it had been studied.

The missing factor concerns the revenue that would have been gained by United if overbooking was generally stopped – not by United alone, but by everybody.

When a passenger tries to book and can't get a confirmed seat, he doesn't just stay at home. Nor does he just restrict his attention to the airline concerned (which appears to be the case that United references in its admission that only some of the revenue would have been lost). The passenger goes out and tries the other airlines.

However, United analysis just doesn't take this into account. At the most, it shows that if United were to unilaterally stop overbooking and if everyone who tried to book on full planes stayed at home or flew on other airlines, then the revenue shortfall would be under $50 million/year. This differs greatly from the statement given.

Ruling Torn Apart

Now, with the knowledge that in 1976 United hadn't even started studying the problem, I can go back to the 1967 CAB item and really tear it apart using its first few words: "In our view, any realistic appraisal of the practice of overbooking . . ."

Good grief, if United doesn't have a realistic appraisal in 1976 and must rely on the type of "evidence" it uses about computet-created seats, there were no realistic studies supporting overbooking back in 1967. (There may have been some studies against it, but the CAB pushed them the other way.)

So, the whole basis of overbooking justification has come unraveled – it was just something easy to do and easy to justify and now turns out to be easy to break. The problem is that, like a building built on brittle girders, once the break comes it is not restricted. The problem is not restricted to overbooking only, it puts into question all the airlines studies on just about anything.

Brittle Justification

That is the problem of brittle data. Computer systems, particularly sophisticated ones like the airlines reservations systems, have to justify their existence every now and then. All DP managers know this. However, the impact of using brittle data to justify a system is simply too far-reaching to be permitted.

Justification simplifications should err on the side of leaving out any values that can't be developed in detail and validated. To do more and to gloss over ignorance is simply to build the installation on raised, brittle floors. And that just isn't good practice.

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Software Ruling Gives Cue on Protection From Taxes

From a Legal Viewpoint

By Roy N. Freed

Special to Computerworld

A major advance was made in the legal treatment of computer programs with the June ruling of the Supreme Court of Tennessee that they are not subject to the Tennessee sales tax.

This important decision closely followed the earlier ruling of the Federal Court for the District of Columbia which stated computer programs are not subject to the tangible personal property tax of that jurisdiction. The case is known as Commerce Union Bank vs. George M. Tidwell, Commissioner of Revenue, State of Tennessee.

The Tennessee court arrived at its ruling essentially by equating the term "computer program" with information and recognizing information can be introduced into a computer not only through the use of punched cards or magnetic tapes or disks, but also by transmitting signals directly, over electronic telecommunications, from the supplier to the CPU of the customer.

The ultimate result of the deliberations of the Tennessee court is entire compatible with the earlier suggestions in these columns that computer programs be identified as processes for processing information, analogous to industrial processes for refining petroleum, producing chemicals and the like.

Use of Compatible Language

Suppliers of computer programs who would like to spare their customers the burden of the sales tax and customers who would like to protect themselves in that respect should reexamine the agreement forms used for those transactions. They should take the cue from the ruling and use language that will be compatible with the ultimate result in that case.

It is essential to recognize agreements are, in many respects, essentially scenarios to courts and tax collectors. So identified, they should be utilized in order to provide the basis for desired legal results.

It is much easier to argue a legal case when the underlying documents are entirely compatible with the position sought to be presented than when they have to be explained.

Key Legal Areas

As the legal treatment of software programs in the tax area evolves actively, it is essential to direct attention to two other key legal areas relating to that subject matter. One is the matter of protecting the proprietary rights in computer programs. The other is allocating legal liabilities that might arise from the use of computer programs.

Despite the persistence of a hearty band of software suppliers who seem to prefer patenting, a broad consensus appears to be developing in favor of the protection of trade secrets.

That approach is entirely compatible with the favorable tax ruling discussed above. Where that type of protection is desired, it is essential to create the appropriate legal basis with the proper language in the agreement relating to nondisclosure and nontransfer without authorization of the owner of the property.

The liability area probably is substantially more troublesome because of the rapid expansion of liability exposure generally under our law.

Impossible to Control Rights

Although it is possible, by careful legal draftsmanship, to allocate liability between parties to a transaction, it is impossible to control rights that might be enjoyed by persons outside the transaction who could be affected by malfunctions in computer programs.

This is so-called third-person liability, which is being experienced with severe adverse consequences by suppliers of products.

One approach is to protect oneself with insurance, which is products liability coverage in the case of items clearly identifiable as products. That insurance is becoming extremely expensive and, in many cases, even unavailable.

Big Question Mark

The availability to software suppliers is a big question mark. At the very least, the matter of exposure to third persons must be treated in the agreements under which computer programs are made available by suppliers.

Despite criticisms of earlier columns that discussed the various categories of properties and transactions and their legal consequences, it is clear our law reflects a whole series of categories and imposes on us the duty to devise our relationships in light of the treatment of the various categories.

Object as we might, the failure to recognize that fact can have consequences too serious to contemplate.

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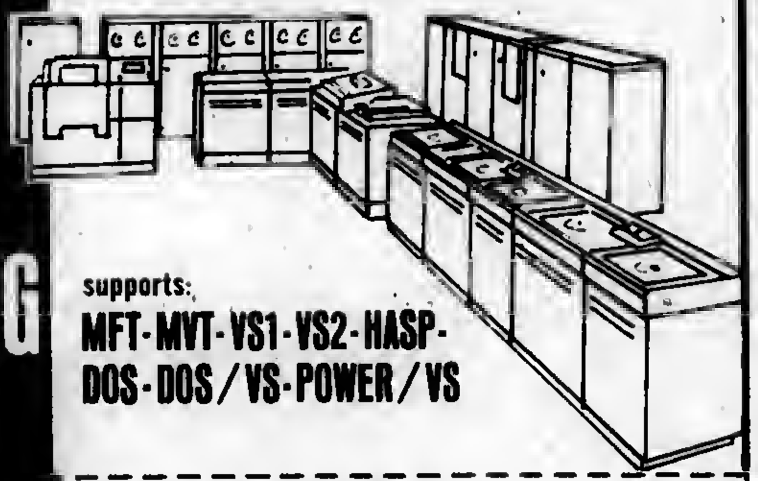

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DP Manager Claims

Logic of Software Physics Gives Guides to Change

By Edward L. Prichard
Special to Computerworld

Every DP manager knows what capacity is – it is what he answers to his management for in terms of cost and what he answers to his users for in terms of performance.

The costs of his configuration are real; they are the monthly checks to IBM, Univac, Itel, et.al., salaries, facility rent, etc.

Performance is harder to express, but it is often seen by his users as service level (turnaround, response time), availability (uptime) and charges (or rates) for service.

The DP manager knows these performance parameters and the total workload must be supported by a specific configuration of hardware, software and DP professionals. The costs of this configuration determine his rates and charges to users.

These charges must be competitive or users desert, so hard constraints are placed on the configuration extent.

Mediating between workload, availability and service level and their attendant costs is what DP managers do – with varying degrees of success – for a living.

Handling the Tools

In other emerging technologies, the area between the artist and the bumbler is historically filled by the emergence of technique, methodology. The work of Taylor in industrial engineering provided the factory manager of the early 20th Century with techniques to rationalize and control the manufacturing process scientifically rather than intuitively. Can such examples serve as a guide to more systematic methods for DP management?

We have been getting some help of late. Eight years ago, Kenneth Kolence offered us the first commercial software monitors; Dudley Warner provided the first commercial hardware monitor.

To the DP manager, these tools are equivalent to Taylor's stopwatch. But how do we *use* these new measurement tools?

What we need is a methodology, a structure to relate all the complicated, unintuitive factors of our measurements to traditional management goals and programs: productivity, return on investment, low cost per service unit, budgets, revenues, business plans.

Kolence now appears again with an offering called capacity management – "the ongoing process of determining the capacity requirements of the workload and assuring that it is provided at minimum cost subject to throughput or response time, reliability and related constraints."

Determining the Workload

Of course. But how to determine the workload in any useful sense? And how to determine the useful capacity of a given set of equipment?

Kolence's answer is, I believe, his brightest contribution. Computers are machines that run software; it is the software executed on a given configuration that produces results or services billable to a user.

The results justify – or fail to justify – the configuration. Create a quantitative science of software behavior and you have a means of relating the results of the measurement tools to the DP management task: an adequate configuration at the least cost.

Kolence calls this science "software physics." Underlying it is the assumption "the fundamental concepts of natural science are wholly applicable to the problems of computer management. It is this assumption which leads to the use of the word *physics*."

Drawing on traditional science, Kolence identifies three basic criteria: The theory must simplify and unify empirical observations (measurements); it must predict the values of such observations (forecasts); and it must be based on common and universal concepts that are valid regardless of how or where they are used and that do not change when applied to specific configurations of different types of hardware and software (universaliy applicable).

The accompanying description of Ken Kolence's theory of "software physics" and some of the values the author sees in the theory was triggered by Barry Stevens' article, "'Software Physics' Standardizes DP Operations" [CW, Sept. 20].

Kolence then makes a fundamental definition of the work performed by computer systems: "A processor performs one unit of software work *on* a storage medium when one byte is transferred to thet storage medium." Processor and storage medium are central concepts.

The class of processors includes CPUs, tape drives, card punches, device controllers, channels and all other such equipment that moves bytes. A storage medium includes main memory, tape, disk surfaces, cards, printer paper and

(Continued on Page 20)

CRT-Based Data Entry Operation Handled by Packages for PDP-11

LEXINGTON, Mass. – The KDSS and TAM data entry packages from Evans Griffiths and Hart, Inc. (EGH) for Digital Equipment Corp. PDP-11s under RSTS/E include a declarative language for CRT screen formatting and can run concurrently with other RSTS/E applications, EGH said.

KDSS is a self-contained key-to-disk data entry subsystem, the vendor said. It has a set of facilities for entry, verification and examination/modification of batches of records and for reformatting that data on output, a spokesman added.

Other capabilities reportedly include support for creation and modification of input and output format specifications by a data entry supervisor and for supervisor control over the data entry process.

These features make KDSS comparable to the "most elaborate" stand-alone key-to-disk entry currently available, EGH claimed.

TAM is said to have essentially the same set of facilities as KDSS for specifying screen formats and edits "except that the leyer of mechanism" which makes KDSS look like a self-contained key-to-disk system is not in TAM, according to EGH.

TAM is intended to be a terminal-handling module for use with RSTS/E applications which have an on-line multi-CRT transaction processing flavor. This package signals which format is needed at what terminal and then handles the interaction between operator and terminal until the format has been completely executed, the spokesman explained.

In both KDSS and TAM, the utilities are implemented in Basic-Plus while the portion of the system that executes the formats, thus controlling the operator-terminal interaction, is in PDP-11 Assembly language and installed under RSTS/E as a "runtime system."

Both KDSS and TAM will be updated later this fall to mesh with DEC's release of Version 6B on RSTS/E. A perpetual license for TAM costs $5,000; KDSS is available for $7,500.

EGH is at 1844 Massachusetts Ave., Lexington, Mass. 02173.

CDC Net Adds Star Service

MINNEAPOLIS – A "super" computer and the technical support staff to help users work with it have been introduced by Control Data Corp. (CDC) as extensions to the company's remote-computing services.

A CDC Star 100 computer with a 512K 64-bit-word main memory and a CDC 6400 as a front-end communications processor is now available to work on problems previously considered too costly – or even impossible – to solve with existing CPUs, according to a network spokesman.

The Star achieves high speeds through use of vector technology in which vast streams of data are processed simultaneously, compared with conventional computers which must handle instructions sequentially, he explained.

Developing or modifying programs to use this technology can be difficult, however, and that is why CDC feels the availability of the support staff is initially equally important as the availability of the hardware, he added.

Programming languages currently on the system include Star Fortran (an enhanced implementation of ANS Fortran '66) and Meta Assembler with a loader, updating routines and "various" utilities also available.

More information is available from CDC at Box 0, Minneapolis, Minn. 55440.

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Software Physics Logic Supports Manager: Prichard

(Continued from Page 19)

other equipment that stores bytes.

Concentrating his theory on the thing moved, a "byte" or any arbitrary group of bits, Kolence defines two of the three basic quantities of software physics: work (or energy) and storage potential (or realization).

The final required quantity is time – execution time. From these properties alone all other relations of software physics follow, including software power, power usage and maximum configuration power.

Two important measures emerge: The natural forecast unit (NFU) is the unit measure of the *product* produced by the unit of software executed.

An NFU can be a paycheck printed, a warehouse inventory report generated, a transmission to or from a terminal, sets of data points plotted, mathematical elements computed – whatever the user gets out of the configuration when he runs his software on it.

The software work vector, Kolence's second measure, is an ordered list of software work per NFU by the equipment classes used by the unit of software, i.e., how much tape work, disk work or CPU work, for example, to produce a specific unit of product.

Thus equipped, with software physics a systems person can trace the effects of any unit of software executed on the configuration and determine its demand on capacity as it flows through the system.

He can relate measurements made on the configuration to the unit of software executed while the measurements were taken.

From the NFU can be determined the capacity requirements of the software in terms of how the user plans his use of the system. The system work performed by each configuration equipment class can be expressed as the corresponding software work vectors.

From the aggregate of all NFUs and software work vectors can be calculated the total software workload and the total effective system power which then can be compared to maximum potential system power by equipment class and by total configuration.

This technique may be extended by any level of detail required by a facility, including not only the subconfigurations of equipment by class (and cost), but also the support software contributions such as operating systems, spooling programs, data base systems and the staffs to maintain them.

Control for Manager

What does a DP manager do with these things? What does capacity management by software physics give him?

It gives him control of the software workload process; it allows him to plan for the capacity to support it, but only when required.

Software physics supplies the DP manager with defensible and comprehensible facility plans and budgets – comprehensible because they can be set in terms of products understandable by his users and his management.

It allows him to stretch his configuration resources further; a computer configuration often can be squeezed like a sponge if one knows where to squeeze.

With capacity management, the DP manager can deal more rationally with the problems of "fluctuating capacity." It is one thing to observe a saturated system at noon on Mondays, another to discover by measurements and adroit tuning of workloads that he can recover 20% of his capacity during that same period. Many a new CPU has been ordered on the strength of the first observation alone.

If capacity extensions are needed, Kolence's methods give the DP manager an independence of action so he can plan for these improvements in ways compatible with objectives and financial programs of his larger organization; he can behave like the other businessmen in his company.

Charge-Out System

On these elements can be built the complete charge-out system. A user's charges can be traced down to his partial use of the lowliest component of the configuration or can be stated in terms that have meaning to him, such as cost per paycheck generated or cost per inventory report.

Quite apart from its utility as a configuration planner, the potential of software physics for better charge-out systems cannot be overemphasized.

Prof. Richard L. Nolan of Harvard presented the results of his research of charge-out systems in his book, *Management Accounting and Control of Data Processing*. One conclusion is key to this discussion: the inevitability of full charge-out systems for all DP organizations better able to relate DP charges to the larger financial objectives of the organization. Software physics is well-suited to meet these developing requirements.

Applicable as It Stands

I do not think Kolence believes his science or software behavior is yet complete. Some exceptions can be made to his definition of software work as being adequate for a complete theory that would ultimately relate software work to instruction set power, to informational entropy or some such.

But as it exists now, software physics in quite applicable to the major problems of DP management. Most fortunately, it is eminently teachable and an excellent method for getting systems people and cost accountants to agree on methods of supporting the financial goals of the larger organization from within the DP resource. That alone is quite an achievement.

A cautionary word to DP managers: Capacity management is not a packaged, proprietary set of programs; software physics is not another set of software monitors and report generators.

Kolence's works are blueprints and guidelines for change in an organization based on sound principles of organizational structure.

In DP management, this structure has a high technological content; Kolence has assimilated this technology into the more general principles of cost accounting, standard costing, charge-out and management planning and control.

Prichard is director of the Data Processing Authority in Portland, Ore., and a graduate of courses at Kolence's Institute of Software Engineering.

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Cullinane Information System 1:00-3:00 p.m.

An introduction to the direction the Cullinane Corporation is taking in providing their clients with a complete information system. Cullinane developments include a Data Dictionary, The SHADOW II Communications Monitor, On-Line Query System, Distributed Data Processing and Mini-Computer versions of IDMS. Also covered will be the CULPRIT Retrieval System and user department versions such as EDP-AUDITOR and EEO-AFFIRMATIVE ACTION REPORTER.

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Seminar Leaders

Robert J. Davis — Mr. Davis is Regional Marketing Manager for Database Systems. He has extensive experience with most aspects of database system design and usage, and has held key positions with both IBM and CINCOM. He is responsible for the marketing of database products in the U.S. and Canada, analyzing competitive products, and finding new markets for database technology. Mr. Davis holds a B.S. degree from the University of Akron.

William E. Linn — Dr. Linn is a member of the Cullinane Corporation Senior Technical Staff. His responsibilities include IDMS training, database consulting and technical marketing support. He was previously with Southern Railway System in Atlanta where he was deeply involved with database administration activities with IDMS. He has his Ph.D. in Computer Science from the University of Michigan and has been associated with the Georgia Institute of Technology teaching data structures and list processing techniques.

Raymond J. Nawara — Mr. Nawara is Southwest/Plains Area Manager of Cullinane Corporation. He has had extensive experience with the design of health and patient-care systems. Previously he was the Data Base Administrator at the Health and Hospitals Governing Commission of Cook County, Illinois where he had extensive experience using IMS. He has consulted in Database Applications for a variety of clients. Mr. Nawara is a graduate of the University of Houston with a major in Mathematics and Computer Sciences.

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Security Package Enhanced

SAN FRANCISCO – Facilities for shared password data sets, improved Time Sharing Option (TSO) functions and protection of data sets by high-level indexes will highlight an IBM OS/VS2-oriented update of the Data Access Security (DAS) package, according to the vendor, Tesseract Corp.

Other enhancements in DAS II will provide improved protection of system data sets, improved tape-handling functions and Volume Table of Contents (Vtoc) protection, as well as a freeform access protection language, the company said.

The access protection language controls security beyond the password level, a spokesman added. It allows the user to restrict the number of accesses to a protected data set or to limit accesses to a specified period of time during the day, he said.

Otherwise, accesses might be limited, for example, to batch or TSO jobs only, to specific named jobs, TSO users or programs or to processing taking place within specified job-accounting parameters, he added.

Most of the changes are made possible because DAS II is a rewrite of IBM's password facility, the spokesman explained. The original DAS built the password from components of the Job Control Language and then provided it to the existing password facility in IBM's OS, he added.

Scheduled for release in the first quarter of 1977 for OS/SVS, DAS II will be adapted to other versions of the operating system later in the year, Tesseract said.

DAS II will cost $8,192; the earlier DAS is still available for $6,500, the company noted from 101 Howard St., San Francisco, Calif. 94120.

Exec 8 Used

DBMS for Univac 1100s Updated

AUSTIN, Texas – An update of the Univac 1100-oriented version of the System 2000 data base management system (DBMS) from MRI Systems Corp. is said to take advantage of "the latest Univac software technology, including the Exec 8 common banking feature."

"Banking" is a Univac technique for controlling the amount of program code and data in main memory at any one time, according to MRI. "Common banking" provides a mechanism for optimum use of memory by many independent run units, a company spokesman added.

With the Univac feature, only the segment of code actually being accessed must be in memory. The reentrant code in System 2000's Univac Version 2.80 allows many users to work with the same segment of code concurrently, thus reducing memory requirements even more, MRI claimed.

The DBMS supports both multiuser and multithread operations, including concurrent updating by several users. Previously, MRI noted, only retrievals could be made in a multiuser environment.

A host language interface load optimization feature has been created and MRI has also made a major enhancement to the system by modifying buffer sizes to match the data recording sector size for the Univac mass storage disk device.

Other enhancements are said to include a reduction of resources used to remove pointers, creation of improved indexes for large data bases and optimization of the hierarchical table maintenance routines for "tree" removals.

In common with other versions of System 2000, the cost of Version 2.80 varies with the options selected, ranges between $30,000 and $110,000 and "typically falls about halfway up that scale," the spokesman added. MRI can be reached through P.O. Box 9968, Austin, Texas 78766.

Two CPE Groups Set November Meetings

DP professionals and others interested in computer performance evaluation (CPE) can attend major user group meetings on successive weeks in November and see a lot of the U.S. in between.

The government-oriented Computer Performance Evaluation Users Group (CPEUG) will gather in San Diego, Calif., Nov. 8-12 to hear papers on system measurement, modeling, interactive and time-sharing system performance and statistical approaches to CPE.

The meeting at the Shelter Island Inn will include tutorial sessions on the major subdisciplines of CPE and a vendor session focusing on commercially available products, according to CPEUG chairman Richard Dunlavey of the National Bureau of Standards (NBS).

Registration – not including hotel accommodations – is $35 and should be sent to CPEUG, NBS, A265/Technology Bldg., Washington, D.C. 20234.

A week later, from Nov. 16-19, the Computer Measurement Group (CMG) will hold its national meeting at the Fairmont Colony Square Hotel in Atlanta. This gathering will include presentation of the A.A. Michelson award to the person who has made the most significant contribution to CPE.

Using "Performance Is Everybody's Business" as its theme, this conference will also include papers, tutorial sessions and panel discussions on both the management and technology of CPE.

As at CPEUG, the meeting will provide time for vendor seminars, according to the program chairman, Dr. David Lindsay of the U.S. Federal CPE and Simulation Center (Fedsim).

Early registration for the Atlanta meeting ($80) may be sent to the attention of Bernard Lichtig at 6118 Bollinger Road, San Jose, Calif. 95129.

IBM Macros Package Aids User Training

WHITE PLAINS, N.Y. – The On-Line Application Simulation Macros package, developed by Shell Oil and now available from IBM, can be used to help train operators in most of their tasks through simulation of a live environment without accessing live data, IBM said.

The package requires the Interactive Training System software and one of several communications handlers.

Cataloged as product 5796-AJZ, the macros can be licensed for $580.

U.S. Patent No. 3,692,255. Born in the clan.

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3M COMPANY

Remote Audio Response Service, User's Own CPU Linked to Ease Order Entry Chores at N.J. Firm

SOMERVILLE, N.J. – It isn't every day a company installs an on-line order entry system, enlarges the scope of its communications system and projects a savings of thousands of dollars per year.

That's what's happening here at Hoechst-Roussel Pharmaceuticals, Inc. (HRPI), a subsidiary of American Hoechst Corp., where an on-line order entry system – based on a remote audio response service provided by Rapidata, Inc. – is replacing a segment of a manual order-taking operation.

"Not only do the orders process into our IBM 370/158 faster," Joseph Macaluso, manager of information systems, explained, "but errors are reduced because there are no transcription steps between the person ordering our product and the computer."

The Rapidvoice service is the latest addition to HRPI's comprehensive sales reporting and analysis systems. "Our job is to help the sales force sell more and penetrate our marketplace," Macaluso said. "Collecting and filling outstanding orders faster helps both our customers and our sales force."

Turnaround Tied Up

The Pharmaceuticals Division was processing 350 to 500 orders on a daily basis. With increasing delays in mail service, an increasing portion of HRPI's customers turned to the telephone to speed up order turnaround.

This development tied up an order-taking department to the extent that many customer calls were not getting through the first time they were dialed, Macaluso recalled. More importantly, he said, an entire department was limited to order taking, impacting its abilities to react to customer problems.

The company asked Rapidata to program Rapidvoice with a special vocabulary to request and verify with the caller the important ordering data. Over 50 product lines, sizes and quantities were encoded to allow the caller to hear the exact name of the product spoken.

In addition, special checks were included to verify order authenticity and accuracy.

Orders are transmitted to the 370/158 under OS/VS1 and Customer Information Control System (CICS) using a special program called Rapidlink.

"Rapidlink effectively bridges the Rapidata network to our CPU. We can use our new order-processing system without changing any code," Macaluso said.

"Furthermore, we receive the benefit of faster data collection without manual transcription and preparation. Lastly, we do not have to invest substantial sums into nationwide Wats lines. The Rapidvoice service is a toll-free call for most of our sales representatives and customers," he added.

System installation was "relatively easy," Macaluso said. The major portions of the development and implementation of the first testing phase were completed in approximately a month.

The project leader, George Fear, senior programmer/analyst for the marketing group of American Hoechst, claimed "the teleprocessing of orders between the two systems was much easier than expected. The Rapidlink hardware compatibility made our internal programming very straightforward."

Once the file was in-house, only minor reformats were needed, he said. The data was subsequently concatenated to the conventional data entry output and input to the order-processing system the same day the order was taken.

"Since overall data control and integrity was of paramount importance, each day's transmission was programmatically batched and each order was assigned a unique order number," Fear said.

This data was then stored in a file and updated daily. "Any break in sequence, or duplication was detected and reported for attention," he continued.

The system, called "Max" by the people at HRPI, has improved the productivity of the order process and the morale of the sales force and customers, Macaluso said. It has also opened a way to growth because it is compatible with industry standards for order format transmission, he added.

"HRPI believes in utilizing industry innovations and developments, such as Rapidvoice, to provide better customer service which in turn helps our company grow," he said.

George Howarth, operations supervisor at Rapidata's computer center, tracks the status of services.

'Faster' Out, CICS In

OSHKOSH, Wis. – California-based Software Module Marketing (SMM) has converted 100 programs from IBM's Faster access method to a Customer Information Control System (CICS) environment for the University of Wisconsin branch here.

The transaction-processing programs were reduced in working storage size by "approximately 50%," according to Donald R. Haueter, director of computer services.

While all documentation that was still relevant was retained, "the changes made by SMM are documented very well," he added.

The university had estimated the conversion would take two and a half man-years using its own staff. SMM's effort lasted only four months.

SMM is located at the Crocker Bank Building Penthouse in Sacramento, Calif. 95814.

RAMIS REPORT *3

How to evaluate the efficiency of a DBMS

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Emphasis on Youth Wastes Experience of Older DPer

By Jack Stone
Special to Computerworld

The Human Connection

Dear Jack:

Your reply to the "Concerned Analyst" who wrote about the "fallacies of hiring" [CW, Sept. 13] begged the issues, so I will answer his fallacies for you in the same sequence he presented them.

1. It is true that, as a matter of current hiring practice, a DPer's past record is the sole measure of his capability. The irony is that most employment departments want to see job stability in the applicant's record – four to five years with the previous company – but have no conscience about hiring and firing as large projects bloom and fade.

2. Without a doubt, job background requirements are solely based on technology experience.

3. Employment departments have advanced the notion of superspecialization to the extreme. They now demand experience with the exact equipment to be installed – witness requirements of late for three years' experience with the floppy disk.

4. Good programmers seldom make good analysts. Programmers design what *they* can program, not what the user needs.

5. Companies will not consider a person for DP if he is over 30, not 40 as "Concerned Analyst" suggested.

Regarding your suggestions for written or oral presentations at interview time to test the applicant's communications abilities, I think they are interesting, but I question their validity unless the presentations are developed to meet a specific job requirement. Unfortunately, very few companies, even the large ones, use job specifications during hiring.

A good 2,500-word essay would take two months to prepare – you would have the applicant starve before finding a new job!

The Answer Man

* * *

Dear Answer Man:

Thank you for sharpening the assessment of today's practices in hiring programmer/analysts. However, I seriously question your judgment of the time required to prepare the essay. I think the task should take, at most, a few days since the applicant should be presenting familiar material.

Readers are invited to write to Stone, c/o Computer Education International, Inc., Suite 222, 2233 Wisconsin Ave., Washington, D.C. 20007, outlining questions, issues or situations pertinent to human relations in the DP setting.

Letters should be no more than 350 words long and include the name, title, organization and address of the sender. That information will be withheld from publication if requested.

If one accepts your statement, one must conclude the creative communications capabilities of programmer/analysts are virtually nonexistent. I concede there are widespread difficulties with such communications and these have been the major causes of system disasters, but they are not as serious as you suggest.

– – –

Dear Jack:

I wonder how often job seekers over 40 have heard: "Sorry, mister, but we have other applicants whose backgrounds more closely fit our requirements."

Often the comment is made to a competent programmer/analyst whose rejection is solely based on his admitted "criminal act" of being 40 or older. Laws intended to protect against age discrimination are easy to circumvent in practice.

Why does reaching 40 virtually guarantee disqualification by employment departments? One reason is company concern about higher insurance rates and higher pension costs.

Another is the belief the individual's knowledge has become outdated and the person is too old to easily learn and accept new ideas and concepts. Yet another reason is the belief the old-timer requires more pay than the younger chaps.

How valid are these views? First, studies have shown older individuals do not, in fact, have significantly higher sickness or absenteeism rates than younger workers. Second, the successful over-40 analyst has many years of experience dealing with the application of proven systems analysis principles, methods, techniques and problem-solving skills, in addition to interpersonal relations.

Finally, with regard to pay, recent M.B.A. graduates are starting at salaries not too far removed from those of people with 15 years' experience, illustrating the great compression of salary scales.

It seems to me the 40-plus professionals offer significant skills not generally found in the rookies: a level of systems experience not available from texts or college texts; commitment to a company until retirement, having completed their job-hopping stints; and a maturity of viewpoint which supports effective DP leadership in management and training positions.

One of the Over-the-Hill Gang

* * *

Dear Brother:

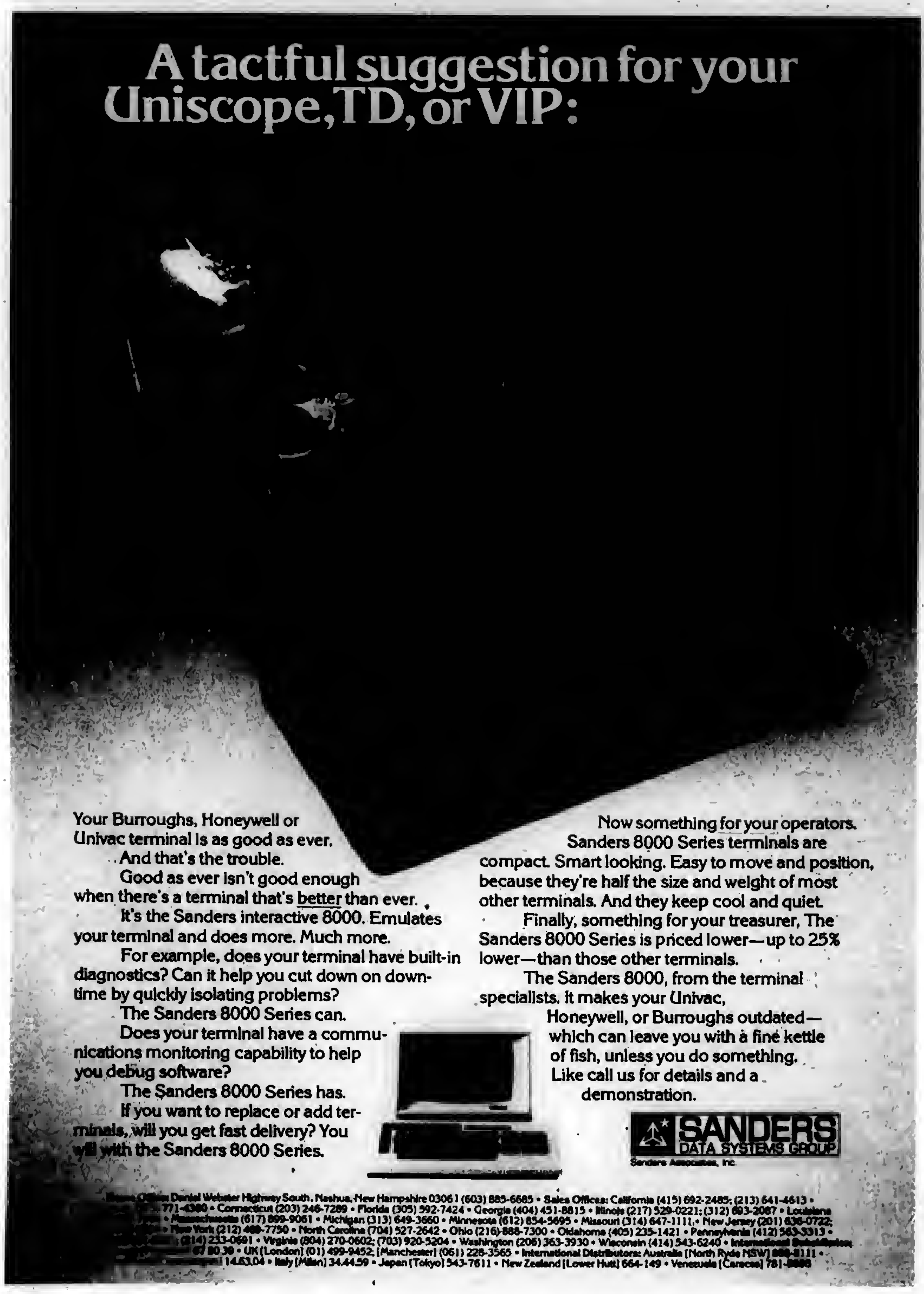
There is no question, in my mind at least, that hiring practices are restrictive in almost every conceivable way and the irony is that such actions only deprive employers of access to the broadest base of talent.

However, I really don't attribute these actions to deliberate attempts by management to discriminate unfairly or illegally. I believe the hiring situation reflects the immaturity of the industry.

A similar situation has faced each of the older technical professions (and I take the stance that DP is indeed a profession), and hiring practices for them have improved through the years.

Until top management recognizes DP has to be planned, directed and controlled in a manner consistent with the test of the organization, DP industry maturity will not take place.

I hope widespread publicity given to these hiring issues will encourage a critical reanalysis of hiring practices and changes for the better.



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COMMUNICATIONS

Data Briefs

Microcosym Has Front End For HIS 6000, 60/66

PEORIA, Ariz. – Microcosym, Inc.'s MCS 30 is a front-end communications processor for Honeywell Information Systems (HIS) 6000 and Series 60 Level 66 computer systems.

Said to be compatible with HIS hardware and software interfaces, the MCS 30 reportedly provides remote access from low-speed terminals to time-sharing, transaction-processing and other direct-access programs.

The MCS 30 is based on the Motorola M6800 microprocessor. LSI technology throughout the system gives the benefits of small physical size, low power requirements and high reliability, Microcosym claimed.

The basic MCS 30 includes RS-232-compatible interfaces for eight low-speed asynchronous lines operating between 110- and 300 bit/sec. Automatic transmission rate detection is a standard system feature; built-in system diagnostic routines can be accessed remotely, according to Microcosym.

Optional features include additional eight-line modules for a maximum 32 lines. For directly connected lines, a 20 mA interface version of the line module is available, the company said.

Memory capacity can be expanded in 8K- or 16K-byte increments to a maximum capacity of 64K bytes; a read-only memory option for program storage eliminates bootloading of the system, Microcosym noted.

An eight-line MCS 30 configuration costs about $30,000. It is available on a one-year lease for $720/mo, including maintenance, the company said from 7342 W. Bluefield, Peoria, Ariz. 85345.

Religious Group Offers Guide On Linking Selectric, Intel 8080

PORTLAND, Ore. – The Center for the Study of the Future is offering a "how-to" book on interfacing the IBM Selectric typewriter to an Intel 8080 microprocessor for inexpensive networking.

The 57-page guide gives purchase pointers, explores Selectric coding and computer I/O requirements and provides an in-depth view of hardware schematics and software interfacing.

"Interfacing Selectrics to the 8080," authored by Carl Townsend, costs $12 from the center, a religious-oriented organization, at 4110 N.E. Alameda, Portland, Ore. 97212.

'Special-Interest Legislation'

Reform Act Hurts Consumers: FCC Chief

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – The Consumer Communications Reform Act of 1976 "is not consumer legislation, but rather special-interest legislation [which] restricts consumer rights rather than enhancing them."

That view was presented by Richard E. Wiley, chairman of the Federal Communications Commission (FCC), at recent hearings on the Reform Act held by the House Subcommittee on Communications.

"Consumers have benefited from new and innovative services, lower rates and a new consumer and competitive responsiveness on the part of the telephone industry itself" as a result of FCC policies, Wiley told the subcommittee.

In taking issue with the position of AT&T and the telephone industry, Wiley said the question "is whether the American consumer is better served by the unfettered access to suppliers of diverse and specialized communications services than by artificial regulatory barriers limiting his or her access to a single-source monopolist."

The FCC chief concluded that "the public interest is better served by the open marketplace [and] we believe the Reform Act would constitute a serious disservice to the American consumer. The majority of my colleagues at the FCC and I recommend against enactment of the proposed legislation."

Impact Cloudy

Thomas Houser, director of the White House Office of Telecommunications Policy, said the impact of the proposed legislation is not clear. "This subcommittee will have to address some very fundamental conflicts which have divided participants in these hearings," he said.

The Reform Act is not basically a choice between competition and monopoly, Houser indicated. "It would be very difficult for the Congress to legislate competition out of existence and it would be equally difficult to force competition to work where it is not viable," he said.

Houser called on Congress to "specify the terms, conditions and quality of competition and monopoly" and define the ground rules of "market rivalry in the future."

Donald Baker, assistant attorney general in the Antitrust Division of the Justice Department, told the subcommittee it "should take positive steps to see that present trends in the direction of more competition are strengthened."

If this is not done, Congress will strip away consumer options and eliminate the existing competitive spur which has resulted in increased carrier responsiveness, he said.

Alfred Kahn, chairman of the New York Public Service Commission, said he regards the proposed legislation "as an abomination. It is a radical bill; it runs counter to our most inveterate traditions of free enterprise.

"My concern is for the welfare of consumers in this country . . . that welfare is served by keeping open to competitive enterprise all markets that are not natural monopolies. And [communications] terminal equipment is not a natural monopoly," he said.

Edward Larkin, speaking for the National Association of Regulatory Utility Commissioners (Naruc), said "the continuation of the present FCC policies with regard to competition" would subvert the national goal of making communications services available to all people at reasonable charges.

Larkin urged the formation of a joint board of federal and state regulatory officials to study the intercity services and terminal equipment areas.

Naruc believes the joint board concept "is the most appropriate means to determine policies regarding competition," Larkin told the subcommittee.

Software-Driven NCR Terminal Debuts at NRMA

PHOENIX – NCR Corp. unveiled a microprocessor-based, software-driven successor to its NCR 280 point-of-sale (POS) terminal for retailers at the National Retail Merchants Association's (NRMA) annual conference here last week.

The programmable NCR 2151 has an 8-bit microprocessor unit with 78 mnemonic instructions and 32K of random-access memory expandable to 64K, NCR said.

The terminal can be interactively linked with the NCR 725 minicomputer processor/controller with 64K to 128K of memory which provides control for up to 350 NCR 280 and NCR 2151 terminals; it can also be tied to the NCR 751 store-level digital concentrator for multiterminal message blocking to a 725, according to a company spokesman.

Stores with 280s will be able to integrate the 2151 into their current systems without disrupting operations, he added.

A "constructor" approach to programming is said to allow a retailer to fill out standard forms describing details of the store's operations, including functions specific to the operation of each terminal.

NCR will convert the information on the forms into programs recorded on cassette tape; the cassette program is loaded directly on the 2151 or into the supervising minicomputer, the company explained.

The retailer, however, can make minor programming changes through the terminal keyboard or through the on-site minicomputer, the spokesman noted, adding the approach allows tailoring the terminal for each location within one store.

The terminal reportedly accommodates optical character recognition scanners and, in addition to recording sales information semiautomatically or manually, provides the ability to handle electronic funds transfer and receiving and marking functions.

A 27-key keyboard can be designed and programmed "in any manner" desired by the retailer to meet special requirements, NCR said.

A three-station, programmable 7 by 7 dot matrix printer operating at 45-, 69- or 120 char./sec (depending on the number of stations in operation simultaneously) can also print double characters in an 8 by 7 dot matrix format, the company said.

The screen of the 2151 is an 8-position LED numeric display with 30 programmable LED descriptors to lead an operator through complicated transactions.

Software-Driven NCR 2151

The price of a basic 2151 with 32K of programmable memory, 2K of read-only memory for program loading and 256-byte memory for hard totals is $4,145.

Initial deliveries of the software-driven terminal are scheduled for the first quarter of 1977.

NCR is headquartered at 17th and K Streets, Dayton, Ohio 45479.

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Terminal Transactions

With Floppy Disk Option

Qualterm Orients Word Processor to Communications

By John P. Hebert
Of the CW Staff

SANTA CLARA, Calif. – The recent addition of a floppy disk store-and-edit unit has transformed Qualterm Terminals' word-processing system into a flexible communications-oriented device and places it in competition with IBM word-processing systems, according to Qualterm's president, Dan O'Rourke.

The Model QFD 100 floppy disk option, shown for the first time at the recent Tele-Communications Association convention in San Diego, can be installed directly inside the company's microprocessor-based QT-145/155 terminal workstation. The result, O'Rourke said, is a true communications word-processing system (CWPS).

The major targets O'Rourke plans to aim for in the near future "are small and medium users with a combination of TWX, Telex and word-processing equipment" such as hospitals and universities as well as applications in government and industry.

"Computerized word processing helps extend services into areas of an organization which otherwise might not be able to justify communications," he said, suggesting the increasing feasibility of electronic mail as one application.

The search-and-edit CWPS, he pointed out, can be used in place of magnetic tapes or cards working in conjunction with a typewriter terminal such as the IBM Selectric.

According to the president of what is now Data Equipment Corp. (Qualterm Terminals is a division of that firm), the CWPS "fills the void for people who want communications in word processing with simplicity and reliability being the key factor in the system's low cost.

The CWPS has a 512-character CRT screen only as an option, for example, and utilizes a Qume Corp. 45- or 55 char./sec daisy-wheel printer which O'Rourke claimed is four to five times more reliable than the IBM Selectric terminal.

A Qualterm word-processing system for a medium-sized user site would include a 55 char./sec printer, one floppy disk drive with disk storage capabilities of 300K bytes, word-processing search-and-edit function keys, a right-margin adjust feature for reformatting 300 bit/sec communications capability and an operator workstation, he said.

That system costs $8,640, or about 60% of the cost of competitive systems, O'Rourke said. Different systems with lower speed daisy-wheel printers, dual disk drives, a CRT, acoustic coupler or cassette tape units would give users greater or lesser capabilities, he added.

Qualterm's CWPS takes advantage of dial-up lines for its 1,200 bit/sec communications because higher speeds are impractical on voice grade lines without sophisticated hardware changes which, he said, drive the cost up.

Qualterm does have optional 9,600 bit/sec communications for its word-processing system, and O'Rourke noted the small, privately held company will be introducing communications at 600 bit/sec in full-duplex mode.

"Qualterm is going for the simple changes," he said, adding he doesn't want the company to do too much pioneering.

"Most terminals are oriented toward programmability, but word-processing equipment is oriented toward operator efficiency in a production environment."

Azurdata Source Data Recorder Collects, Transmits From Memory

RICHLAND, Wash. – Azurdata, Inc. has a source data recorder, the Electronic Notebook Terminal (ENT), that collects data and transmits it directly from memory.

The ENT unit collects information and stores it in its solid-state memory. It also contains electronics enabling it to transmit the collected data to a CPU at any time and over available dial-up telephones, according to an Azurdata spokesman.

The ENT terminal is self-contained and includes solid-state function and control electronics, solid-state memory, battery pack, data entry and function control keyboard, segmented LED display, a Bell Data Access Arrangement (DAA) interface and a built-in Bell 202-type modem that provides for transmission at 1,200 bit/sec in Ascii, he added.

The terminal provides for the keyed-in entry of product codes up to seven digits and quantity codes of up to five digits on the same line.

This information appears on the LED display as entered, with a field separation between product number and quantity, Azurdata said.

There is also provision on the display for various status symbols that inform the operator of the next type of input required, thus programming the inputs.

If the operator fails to make the input required by the status symbol, the keyboard is inactivated, an alarm sounds and the operator must press the "clear" key and then reenter the proper information, the spokesman explained.

The built-in battery pack provides over 10 hours of operation, supplying power for entering data, holding it in memory and transmitting the data directly from memory. The battery can be recharged using current from a regular wall socket, the firm said.

Standard memory is 2K and is optionally expandable up to 12K. Keyboard controls enable the operator to go either backward or forward through memory, with each line shown on the display for viewing.

Direct transmission from memory is made by using a small acoustic coupler placed over a telephone mouthpiece.

The ENT costs "less than $1,000" from Azurdata at 1305 Mansfield Ave., Richland, Wash. 99352.

The ENT was designed for installations and applications where large numbers of source data terminals are required, Azurdata said. Typical applications include inventory and reordering, route and delivery operations, multioffice accounting services, motel and hotel chains, fast-food chains, and auto part store chains.

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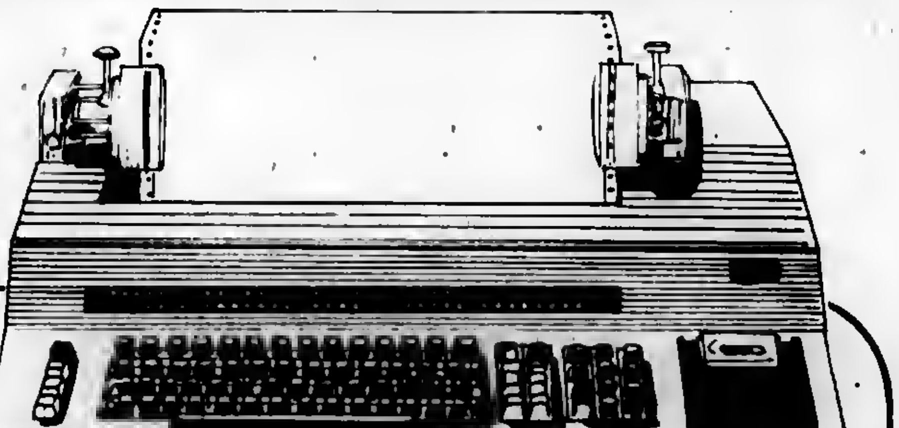

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Carrier Representatives Can Help

Planners of Overseas Nets Urged Not to Work Alone

By John P. Hebert

Of the CW Staff

SAN DIEGO – Humor, patience and good rapport with the representative of an overseas data communications carrier are the vital ingredients for establishing an efficient international communications link, speakers at a recent convention here agreed.

The advice was a prelude to a discussion of the myriad pitfalls awaiting the communications or DP manager whose firm is considering an international communications link. Speakers represented major international carriers in the U.S. and one U.S. user of international communications.

But the subject of problems and pitfalls in setting up telecommunication facilities abroad "couldn't be adequately covered if we were given six years to do so," according to Martin Finkelstein, vice-president of switched services marketing for RCA Global Communications, Inc.

"The services offered in each country and by each carrier are different. They all have overseas representation for your use and can avoid the pitfalls for you. Use them," Finkelstein advised.

The initial confusion suffered by most American communications managers when they try to carry out their assignment in an overseas country usually results "from their direct dealings with some of the government-controlled communications entities," he said, adding many problems could be avoided by first soliciting assistance from an international representative.

"International telecommunication services around the world are provided by a combination of private, semiprivate and international voice/record carriers and government postal, telephone and telegraph [PTT] administrations," he told the audience.

Planning Essential

Companies considering establishing international communications should do proper planning, which is determined by the type of service needed – from a simple 16.5 word/min telegraph channel to a 50 kbit/sec private system, Finkelstein continued.

Proper planning, he said, should involve attempts to find out whether privacy is an important consideration; what terms and conditions are demanded by the international carrier; who provides the equipment rental; and how long it takes to get equipment on the lines.

"In some countries, such as Germany, the user must arrange for a commercial vendor to provide the equipment. In other countries, such as Italy, Telex units are provided by the Ministry of PTT. A one-year contract is required by the ministry and the annual rental fee is approximately $400," he noted.

Delays Common

Another common pitfall, according to Finkelstein, is a significant delay between the time of application and the time of installation – a two-year delay in the case of Olivetti teletypewriter units in Italy, the only units permitted for teletypewriter operation in that country.

Harry Schwedock, vice-president of marketing at ITT/World Communications, suggested users "get bids from more than one of the international record carriers – and if one's implementation schedule is less than the others, he's lying.

"But it's your fault for successfully convincing yourself that installation will not take as long as the international carriers have said it would.

"All of the overseas carriers do as well as possible" to implement the communications operation of a U.S. company, he added.

Schwedock noted further the U.S. carriers have little control over implementation schedules overseas.

"Use your international carrier as a coordinator, it offers extensive services; demand performance, but realize the problems involved in setting up an international communications link," he advised.

According to Schwedock, competition between the U.S. carriers is "fairly stiff" and the user has reaped the benefits from that competitive climate.

Jack Hill, communications manager of Electronic Memories and Magnetics, said some of the problems on leased lines are often designed into the service and include cost, line speed, time differential, network type and equipment backup necessary when the international carriers' lines are inoperative.

With TWX/Telex methods, the main problems Hill has encountered have been interruption of service in the middle of a message and inability to establish connections in some countries.

The international carriers, however, "make every effort to eliminate the frustrations caused by these subjects," Hill said.

(Continued on Page 30)

Micom Designs TDM For Bell DDS Users

CHATSWORTH, Calif. – A digital time-division multiplexer (TDM) designed for channelizing AT&T Dataphone Digital Service (DDS) links has been introduced by Micom Systems, Inc.

The Model 720 digital data multiplexer makes it possible for DDS links operating at 4,800- or 9,600 bit/sec or 56 kbit/sec to be split into two or more channels, synchronous or asynchronous, according to Micom.

The multiplexed channels may be dial-up or leased, full-duplex or half-duplex; the multiplexing of half-duplex, polled multipoint circuits is also supported; the firm said.

System uptime reportedly is maximized with low-cost redundant common logic and power supplies. Monitoring and fault isolation on the DDS link are available from either end, Micom said.

Prices start at "less than $1,400 per end" from Micom at 9551 Irondale Ave., Chatsworth, Calif. 91311.

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Besides Impacting Communications

Reform Act Could Affect DP Industry, Users Warned

By John P. Hebert
Of the CW Staff

SAN DIEGO – The Consumer Communications Reform Act of 1976 not only will have a formidable impact on data communications users if it becomes law – it will also directly impinge on the computer industry, according to a regulatory attorney.

Herbert Marks, counsel for the Independent Data Communications Manufacturers Association (IDCMA), recently told a Tele-Communications Association conference plenary session on the Reform Act here what he believes is at stake with the AT&T-supported legislation, which has become known as the Bell Bill.

What is happening, Marks said, "is a call for a moratorium on further implementation of competitive policies" in the communications industry.

"If the legislation is enacted, you will lose the ability to demand the best terminal equipment for your network; you will lose the ability to get a carrier responsive to your needs; and you will lose the ability to establish economically feasible telecommunications systems – especially across state lines," Marks told an audience of communications users.

Ramifications for DP

On the computer equipment side, "the bill to hamper competition in all respects has important ramifications in its vast effects on systems design," the IDCMA counsel said.

The legislation, initially introduced into Congress as H.R. 12323 by Rep. Teno Roncalio of Wyoming, would encourage the development of different standards for interconnection and interconnection policy if enacted, Marks stated.

Enactment of the proposed legislation would give state commissions control over station equipment and terminating facilities and foster fragmentation of an integrated national telephone network, he added.

Bell will publish page after page of specifications for interconnected equipment, which will be "no bed of roses" for vendors, he said.

"Each of the 50 states will be given jurisdiction over terminal equipment. Then the question of how to define 'terminal equipment' will add to the confusion," Marks predicted, explaining the ramifications of communicating across state lines and the implications of having to design each network node differently.

On the communications side, "let's not assume enactment of the bill will exempt existing carriers . . . We have to decide if we want to live in a world without any of those alternatives," he said.

The "basic issues" have been missing in arguments countering the legislative proposal, Marks said, noting sponsors now number 175 in the House and 17 in the Senate.

"Computer and communications systems are now becoming – and will continue to become – increasingly vital to business and government. What does that mean?" he asked.

In answer, Marks said the costs of goods and services will be impacted if there is a fragmentation of service on the state level; there will be a resulting loss of jobs and many kinds of devices will not be available, he added.

He further told attendees the National Association of Regulatory Utility Commissioners (Naruc) has reported that non-Bell computer equipment has had no severe effect on the Bell network and that it has been documented on the public record that Bell developed advances in modem equipment only in response to competition from independent firms.

Marks then told the users they had a "very special responsibility.

"You know what competition has meant for your systems and, rather than have the legislators hear lawyers' and economists' views, I think the people with the facts ought to make a specific appeal."

Net Planners Urged Not to Work Alone

(Continued from Page 29)

Another problem encountered, he said, has been the receipt of invoices from "bogus directory publishers.

"I'm sure many of you have received, at various times throughout the year, invoices for directory services in varying amounts for directories that had not been ordered. Do not approve these invoices," he advised.

All solicitations for unauthorized TWX/Telex directory listings should be referred to the Consumer Protection Agency in Washington, D.C., for investigation and possible prosecution, he said.

In spite of the pitfalls, Hill said, the international carriers are continually upgrading their service and equipment. Because of the intense competition between the U.S. carriers, there should be better service in the future – possibly at faster speeds and lower costs, he predicted.

Larry Cohen of Western Union International (WUI) noted data communications in the spectrum above and including 2,400 bit/sec speeds has grown substantially over the last decade, particularly in Europe.

Ten years ago, Cohen said, the standard was communications at 1,200 bit/sec. Today the transmission speed overseas includes 2,400-, 4,800- and 9,600 bit/sec speeds on voice grade lines and 50- to 64 kbit/sec on special satellite channels.

The user should, however, be aware of propagation delays that can last up to .5 sec or more per block of data transmitted, resulting in only 37.7% efficiency.

For example, a 2,400 bit/sec line has a final efficiency of only 905 bit/sec, while a 9,600 bit/sec line will have an effective speed of only 1,300 bit/sec, according to Cohen, who noted these figures don't take transmission errors into account.

The additional line costs between the lower and higher speeds may not be worth the proportionately low increase in final output due to propagation delays.

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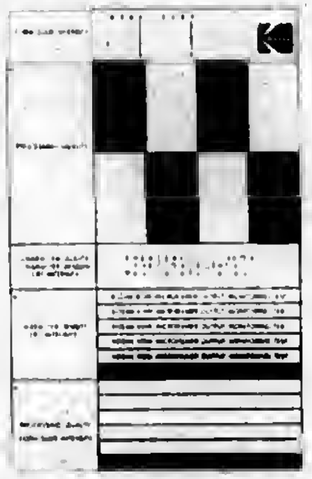

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Computer output microfilming is a major management decision. The closer you are to COM, the sooner you may gain by asking Kodak to come in. If you are in a position to make this kind of decision for your company, we would like to send you an informative overview of microfilm and the computer. Write today. Eastman Kodak Company, Business Systems Markets Division, Dept. DP6703, Rochester, N.Y. 14650.

Kodak people – working together to make COM work for you.

Kodak

Point-to-Point Net Users Urged To Plan for Potential Problems

By John P. Hebert
Of the CW Staff

SAN DIEGO – Users should not think they can solve an on-line system failure without being prepared, They should think and plan in advance of actual problems occurring because they will always happen at the worst possible time.

According to speakers at a recent Tele-Communications Association Conference session here, this is the best way to isolate on-line systems problems in point-to-point communications networks.

Speaking solely in reference to the segment of a communications link between modems, Don Combs, head of computer communications support at Safeway Stores, had a long list of suggestions to spare users the danger of alienating a vendor of common carrier services.

"Don't call Ma Bell and say you have a circuit problem when you haven't checked the modems. The great majority of on-line systems problems are simple things," Combs said.

A number of things can be done to facilitate problem isolation; users should keep track of what they do at the time of system test – and who they do it with, he advised.

Users should have one end of the network in charge of relations with the carrier when a problem occurs; try to isolate the fault by elimination or replacement of equipment because it's the easy way; and determine what test equipment is needed before the problem occurs, Combs said.

Sophisticated equipment isn't always necessary to do the job, he added.

In the area of vendor relationships, Combs suggested users should establish a good relationship before it's needed as a vehicle to solve a problem.

Users should not tell the vendor how to do his job but should inform the vendor of the specific outcome of the problem if it is solved without the vendor's help and praise or condemn the vendor when it is justly deserved.

Infotron TDM Works On DDS Facilities

PENNSAUKEN, N.J. – Infotron Systems Corp. has introduced the Timeline 290 Miniplexer, a synchronous time division multiplexer (TDM) for use on both Bell's Digital Data Service (DDS) and conventional facilities.

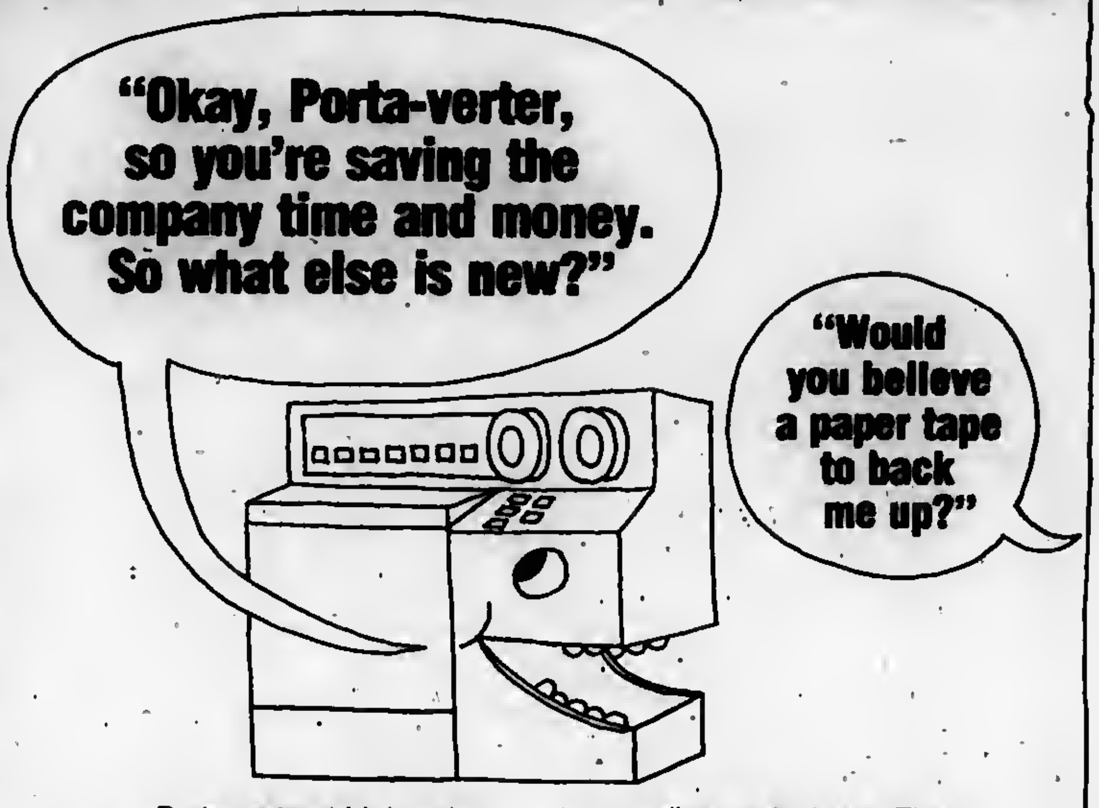
Applications are said to include remote job entry, IBM 3270 to other synchronous CRTs and CPU-to-CPU transmissions.

Users of Bell 209 modems reportedly can switch to DDS and employ all-digital transmission and Miniplexer multiplexing without losing the bandsplitting benefits of the 209.

The Miniplexer can also be used for bandsplitting on conventional facilities, Infotron claimed.

The Timeline 290 will split a 2,400-, 4,800- or 9,600 bit/sec DDS or conventional facility into two, three or four separate channels. Input can be a mix of DDS and conventional at speeds of 600-, 1,200-, 2,400-, 4,800- and 7,200 bit/sec.

The Miniplexer is priced at $1,500 per end, complete with four channels, Infotron said from 7300 N. Crescent Blvd., Pennsauken, N.J. 08110.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The Course Work

Using case studies, interactive discussions and workshops, this two-day seminar examines the human relations conflicts that commonly effect most computer centers, and presents strategies and techniques for resolving them.

The seminar is intended to give each attendee a new and practical understanding of the aspirations and motivations of computer professionals. It is designed to help DP managers communicate more effectively with senior management, and develop more positive relationships with end users and other people outside the data center. This includes the development of a "public relations" program for DP center, with the object of increasing end users' understanding of how the computer center can help them in their jobs.

Here are just some of the things you will learn:

- How to improve performance among operations personnel, despite typically poor attitudes.
- How analysts and programmers have a different view of their jobs than management, does and how to handle the resulting conflicts.
- How to replace "management by crisis" with "management by plan."
- How to increase the people-productivity of your DP center and thereby make it more useful to your entire organization.
- The pros and cons of structured design and programming management techniques.

Jack Stone, PhD, is the Seminar Leader

Jack Stone, PhD, is managing director of Computer Education International, Inc., and is recognized for his abilities as an author, educator, and consultant to EDP managers. A Phi Beta Kappa graduate from Princeton University, Dr. Stone has been involved with computers and electronic systems for over 23 years, including 8 years as a Manager at IBM, where his responsibilities included development of Instructional Systems, as well as management of a DP center; and 7 years as a principal in several independent firms supplying management consulting and training services to large computer centers. He is a member of ACM, DPMA, AMA, and the American Society for Training and Development. Dr. Stone has contributed many articles and columns to *Computerworld* on the subject of EDP human relations, and presented a paper at NCC '76 on "ADP Training Systems." He is currently preparing his first book for publication, which deals with human relations in medium-to-large computer centers, and these works will form the basis for the extensive materials you'll receive in the course.

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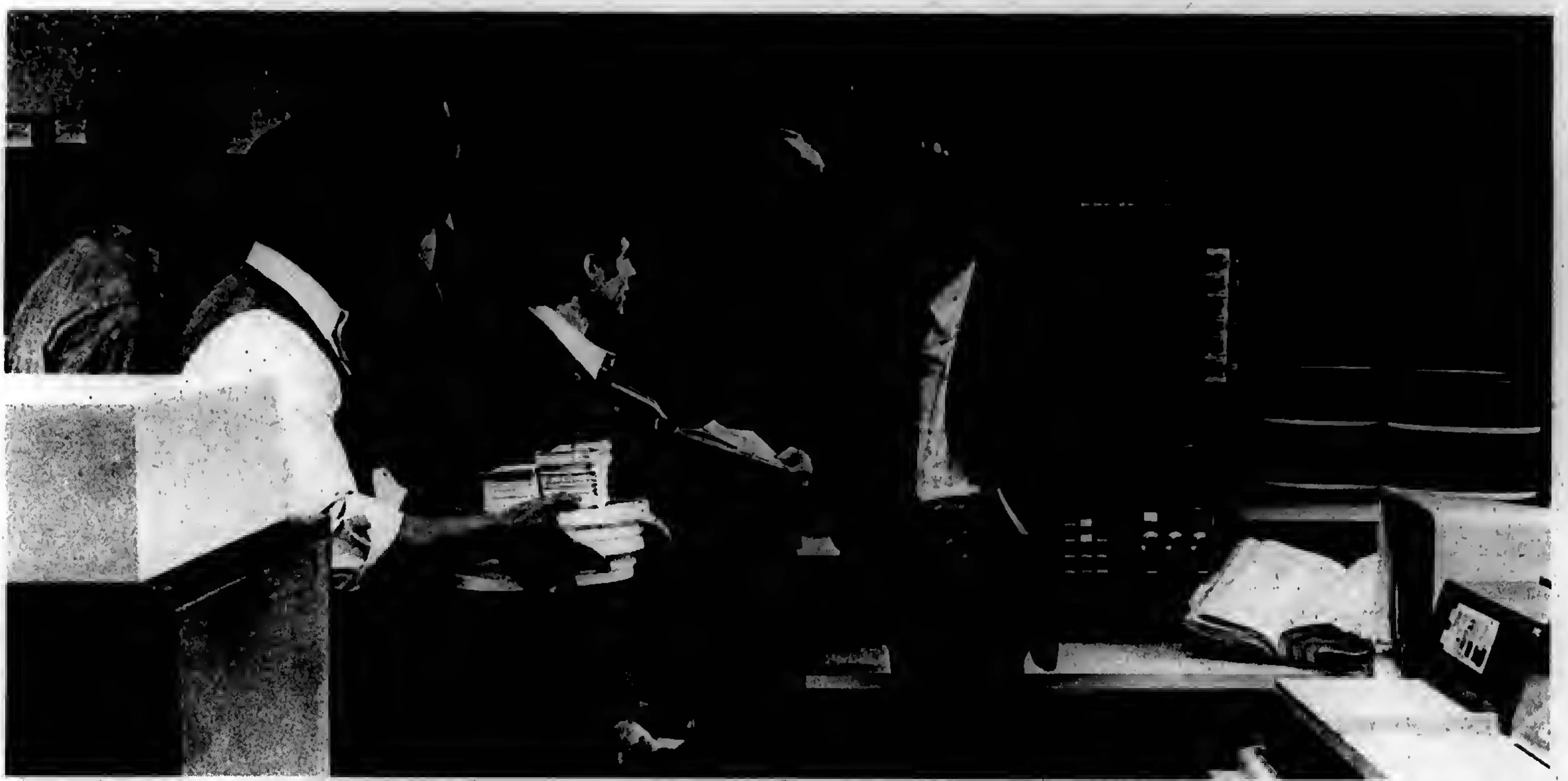

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Bits & Pieces

AUUA Fall Conference Commences Today

WINSTON SALEM, N.C. – The Americas Univac Users Association's (AUUA) Fall 1976 Conference at the Hyatt Regency Hotel in Washington, D.C., begins today.

Over 80 formal sessions have been scheduled concerning hardware, software, applications and general interest. The conference is open to all users of Sperry Univac products.

The meeting will be the second since AUUA's formation in October 1975 from a merger of the former Univac Users Association and the Computer Users Association.

Additional Information on the conference can be obtained by contacting Charles W. Esserwein, at Gay & Taylor, Inc., P.O. Box 1410, Winston Salem, N.C. 27102.

Memorex Determines 3650 Prices

SANTA CLARA, Calif. – Memorex Corp. has determined prices for its 3650 disk storage subsystem, according to a spokesman.

The plug-to-plug, IBM 3350-compatible device [CW, Sept. 9] costs $1,000/mo for the direct access storage model, $1,260/mo for the 3653 disk storage module and controller, $1,305/mo for the 3654 module and alternate controller and $2,300/mo, including maintenance, for the 3674 control unit on a 24-month extended-term lease plan.

Ninety-day and one-year plans are also available, Memorex noted from San Thomas at Central Expressway, Santa Clara, Calif. 95052.

Symposium to Feature COM Topics

COLLEGE PARK, Md. – A symposium to be held here on Nov. 22-23 will discuss several topics of computer output microfilm (COM) including "COM Feasibility Studies," "COM Software Issues," "Evaluation and Maintenance of COM/Computer Input Microfilm (CIM)" and "Managing a COM Facility."

Jointly sponsored by the ADP Management Training Center of the U.S. Civil Service Commission and the Federal Government Micrographics Council, the symposium is open to all government employees and U.S. military personnel.

The joint symposium and exhibition costs $65 per participant; the exhibition alone costs $15.

Information is available from U.S. Civil Service Commission, ADP Management Training Center, TOA-GMS, Washington, D.C. 20415.

By Increasing Annual Productivity

Tape Handler Saves SSA $1 Million

Special to Computerworld

BALTIMORE, Md. – The Social Security Administration (SSA) is saving about $1 million/year in increased productivity through the installation of a tape mounting and control system on its IBM mainframes, according to an SSA spokesman.

The SSA maintains approximately 325,000 reels of magnetic tape in its tape library vault, with 20,000 of these reels required for either input or output in daily computer runs, he said.

On the average, a tape mount or dismount takes from one to two minutes. During that period, the tape drive remains idle and, in turn, the system cannot process the job.

Because idle computer time cannot be regained, processing becomes very costly. In addition, the potential for tape handling mistakes exists, which accounts for the possibility of reruns and missed deadlines, the spokesman noted.

Realizing that reduction of tape and handling mistakes could save it money, the SSA began to evaluate and eventually installed a tape mounting display and control system from Scientific Measurement Systems, Inc. (SMS).

Prior to the installation of the tape control system, an operator at a console would call out the number of the tape to be mounted and the identity of the tape drive through a public address system.

Hopefully, the tape mounting personnel would remember correctly and get the right tape to the right drive, Mike Abramowitz, DP technical advisor, said.

In other cases, personnel would refer to an IBM 2740 console in the middle of an aisle which would pick up the message from the operating system and display the number of the tape and the file device. The tape handler would still have to leave the console and remember the numbers, he added.

Messages Displayed

Now, the display units, installed on top of individual tape drives, display messages about the specific drive that must be acted upon. Tape handling messages are also displayed at a master console printer or CRT, he noted.

Colored flashing indicators attract the operator's attention and are large enough for the handlers to see from the tape library, Abramowitz said. A flashing yellow light signifies a mount is required and a red light indicates dismount, he added. An eight character alphanumeric display alternately flashes job name and volume serial number, he added.

Prior to the Installation, the SSA reasoned that because tape drive displays bring the request for personnel action to the tape drive and not just to an isolated peripheral device, such as a CRT or console printer, a reduction in the time required to mount and dismount tapes and a substantial reduction of mismounts would result, according to Abramowitz.

The primary question of the SSA personnel evaluating the display system was: Would the savings be sufficient to justify an acquisition of tape drive displays?

The results of a pilot study provided the answer: CPU utilization increased over 10%; total job runs increased nearly 8%; Abends were reduced 11%; and high-speed tape drive utilization per job decreased approximately 3%, making drives available for other jobs waiting in the queue. (See accompanying box.)

The evaluation indicated significant improvement; interviews with operations management and operators indicated operations management acceptance was very high.

The tape display system provided operations staff with a tool for monitoring performance from a central point and determining whether work was continually being processed, Abramowitz said.

The operations staff no longer had six-digit label numbers; job name and job number were also made available.

After the pilot study, the SSA contacted a number of other users of tape display systems to find out if they had experienced the same kinds of savings. When this was confirmed, it issued a request for proposal, according to Abramowitz.

Bids were solicited from seven vendors and advertised in the *Commerce Vendors Daily*. However, only SMS responded, an SSA spokesman said.

The units are presently installed on 15 of the systems with four more to be equipped soon, Abramowitz said.

SSA Pilots Study

BALTIMORE – The Social Security Administration (SSA) conducted a pilot study on tape handling optimization in a controlled environment on its System Number 15, an IBM 370/165 with 63 tape drives.

For a period of 45 days (three daily shifts, Monday through Friday) between July 16 and Aug. 31, the tape drive display system was tested in a regular work environment (a basically repetitive 45-day cycle) and the system's efficiency was compared to an equal period of time prior to the test, a spokesman said.

The results indicated the total CPU time increased to 3,975 minutes more than the June 1 to July 15 period. This averaged 120.45 min/day more after the system was installed.

An increase in total jobs run after the Installation of the tape displays was also noticed. From the period June 1 to July 15, 6,972 jobs were run in comparison with 7,609 jobs accomplished in the later period, averaging 19.3 jobs more per day, the SSA spokesman said.

Extrapolating the savings to the two 370/165s, two 370/168s and 13 370/65s then at the SSA, the agency found the potential net savings would be close to $1 million/year, it said.

Consulting Service Aids Firms In Selecting Data Entry Gear

NEW YORK – Advanced Keyboarding Systems is offering a consulting services package to help companies select and convert data entry hardware, according to a spokesman.

Included in the service package is a review of the firm's DP requirements to determine the best equipment for the job.

A trade-off analysis is conducted to measure the cost-effectiveness of the proposed plan against present operations, in terms of money, time and people, the spokesman stated.

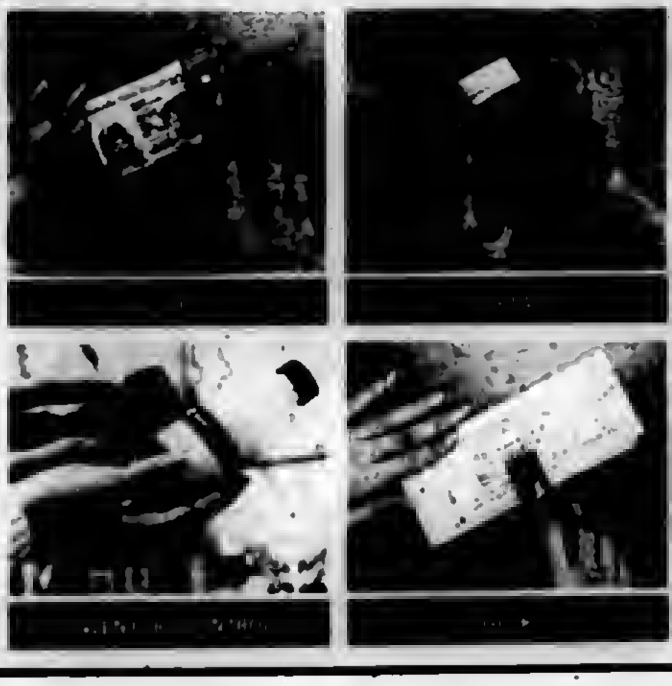
Detailed functional specifications for the proposed system are developed in terms of the equipment characteristics. Detailed equipment specifications in a format suitable for use as a request for proposal are included, he added.

The service includes organization and monitoring of a bidders' conference and after this specific hardware recommendations are given.

Finally, the firm will help handle negotiations and aid in the installation.

Typically, a 20-person data entry department analysis with 80 different jobs would cost $5,500, exclusive of negotiation costs, according to the spokesman.

Advanced Keyboarding Systems is at 437 Madison Ave., New York, N.Y. 10022.



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Beermaker Picks DP Site With Priority Checklist

NEWARK, N.J. – How does a large company decide to choose a particular site for a computer center?

The F.&M. Schaefer Brewing Co. considered a checklist of 62 criteria and conducted physical reviews and analyses of 37 different sites in New York City, Westchester County, N.Y., and New Jersey before settling on a building here.

The internal study was undertaken under the direction of Joseph Franzam, director of management information systems, and Howard Halperin, DP manager.

Schaefer had decided to relocate its entire DP facility from Brooklyn, N.Y. The eight most important criteria the firm considered were:

- The firm's computers had to be located within a 25-mile radius of its prime users.
- The center had to be well protected from intrusion and possible sabotage.
- A similar configuration at another data center where time could be made available had to be close by.
- The primary source of power had to be reliable. Sudden shifts in power, whether surges or dips, could cause the facility to shut down; the possibility of this type of occurrence had to be minimal.
- The data center had to be situated below the seventh floor of a building because that is the maximum range of most effective fire-fighting equipment.
- Users had to be able to easily communicate with the data center and have easy access to data center services to and from remote locations.
- Space for expansion had to be available.
- The company had to be able to attract as well as retain a quality staff for its data center.

According to the firm's findings, New Jersey proved to have an edge over the other areas in three categories – the availability of a backup data site with adequate time, the availability of a quality staff and the availability of a reliable source to power.

All of the other criteria, with the exception of the sixth floor limitation which eliminated many Manhattan sites, proved relatively equal in all three geographic regions.

In reviewing and grading each of the 37 sites, the Schaefer study determined the final site attained the highest overall rating and satisfied each of the eight major criteria.

The site selected was International Plaza on Route I-9 opposite the Newark airport.

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WANGCO

CDC Disk Packs Handle Calcomp, Univac Drives

MINNEAPOLIS – Control Data Corp. has introduced two series of removable magnetic disk packs for use with California Computer Products, Inc. (Calcomp) Trident drives and Univac 8416/8418 disk drives.

The CDC 875 series packs provide 54.7M or 82.1M bytes of data storage for users of Calcomp T-50 or T-80 drives respectively.

Each pack contains three recording disks with five data surfaces; the sixth surface holds prerecorded servo positioning and index/timing information, CDC stated. Packs also include upper and lower protective disks.

Data is recorded at 4,040 bit/in. on the Model 875-70 and at 6,060 bit/in. on the CDC 875-80. Recording surfaces of both packs contain 815 tracks at a density of 370 track/in.

The CDC 884-60 and 884-80 were designed for use with Univac 8416 and 8418 disk storage drives respectively.

The CDC 884-60 stores up to 28.9M bytes of data.

Purchase prices for the Trident-compatible CDC 875 series packs are $427 (for the 875-70) and $433 (for the 875-80).

CDC 884-60 and 884-80 Univac-compatible packs cost $358 and $484 respectively, the company said from Minneapolis, Minn. 55440.

Decision Data Adds Printer, Reader/Punch

HORSHAM, Pa. – Decision Data Computer Corp. has printer and card reader/punch models for IBM 360/370 systems, the firm said.

Users can select speeds of 300-, 450-, 600-, 900- and 1,500 line/min for the printers, the company noted.

The 80-column card reader/punch reads at 200 card/min and punches 45- to 75 card/min, depending on the number of columns punched, the firm said.

The 96-column unit reads at 300 card/min and punches 60- to 120 card/min.

All units are connected to the multiplexer channel through their controllers and are compatible with the 370 and 360 operating systems, he noted.

The printers and controllers range in price from $16,250 to $45,750; the card reader/punch costs $14,950. Decision Data is at 100 Witmer Road, Horsham, Pa. 19044.

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Also Brings Fuel Savings

Dairy Using System to Assure Fresh Milk Delivery

FLEMINGTON, N.J. – Johanna Farms here is using a computer to reduce milk inventories and help assure fresh milk deliveries to its customers, while at the same time enabling fuel savings with better planned truck deliveries.

Incoming orders – from supermarkets, convenience stores, hospitals and schools in New Jersey, eastern Pennsylvania and northern Delaware – are now entered on terminals linked to an IBM 370/125.

"We are producing to order," Frank Hunter, DP manager, said.

"This means we buy just enough milk from farmers' cooperatives and process only the quantities we need to fill orders.

"That in turn keeps inventory on this perishable product low and in-house a very short time, getting fresher products to our customers," he added.

"Accurate and timely totals of products ordered by each customer have meant elimination of most two-load deliveries to the same customer," Hunter said. "Formerly, production was based primarily on our drivers' estimates which were subject to error, especially as our business grew."

"Special deliveries also have been reduced, amounting to a significant yearly savings," he said.

Most orders are taken by telephone. As orders are received, the customer number and item and quantity information are entered into IBM 3270 video display terminals linked to the 370/125 at the plant.

The system edits the information and displays on the terminal's screen the unit count, total case count and totals of the order, which the order taker confirms with the customer.

The information is also entered into the computerized production scheduling system which is run twice a day. This tells the plant how much milk must be produced for the next few hours according to package size and label name.

A load report and customer delivery tickets are computer-printed.

"With the present system, we can determine ahead of time whether an order for a particular group of customers is so large one truck can't handle it," Hunter said.

"So we have an overflow truck waiting. Before, we didn't know of an overflow situation until after a truck was loaded. Then loaders became aggravated because they would have to remove heavy milk cases off the truck."

Service Firm Finds CPU Alarm Reduces Worried Clients' Calls

By Esther Surden
Of the CW Staff

CLEVELAND – An alarm on the CPUs at Champion Service Corp. here is helping that firm prevent downtime for its customers who rely on the more than 600 terminals connected to its mainframes, according to John R. Hall, president.

The company provides savings and loan institutions and banks with on-line, real-time communications to customer files. The financial institutions it serves are located within a 35-mile radius of Cleveland.

"A thousand or more people can access the system at any one time," Hall noted, "and we wanted to know as soon as possible when the system was down.

"We felt it made sense to get an alarm device. When the computers would go down, it would take our customers five minutes to recognize their terminals weren't working, to realize it wasn't mistaken data entry and to call.

"Five minutes later the phones here would start ringing until we could get the systems up and running again."

With the alarm system, the company knows before its users do that a failure has occurred and can begin to rectify the situation before the barrage of phone calls, Hall noted.

Often the phone doesn't even have a chance to begin to ring, he added.

The company has a mix of IBM 360/30 and Digital Equipment Corp. PDP-11/40 CPUs. Momentary outages can happen "sometimes four times a day and sometimes once in two weeks," depending on error conditions, Hall said.

The alarm, a Sentry/360 from CRU, a Cleveland manufacturer of computer performance measurement systems, checks bits in certain areas of memory.

"Every X number of milliseconds we put a bit on in certain core locations; the alarm tests that bit in that position of core," Hall explained.

If the bit isn't there, an error condition is reported and the alarm sounds.

Because the CPUs are essentially stand-alone devices, the alarm system has been very helpful, Hall added. The shop could essentially go on working without even knowing that the units were down or in an error-producing situation, he noted.

The systems at Champion work 13 hours a day from about 8 a.m. to 9 p.m.; about 40 people are employed by the organization.

OCR Reader Features Adjustable Optics

ROCKVILLE, Md. – The OEM RIT 2000 Mini optical character recognition (OCR) reader is now available from Input Business Machines, Inc.

The RIT 2000 comes as a single hand-fed transport with adjustable optics for line read selection. An automatic feeder and automatic edger are available as options, the vendor said.

Minimum configuration transport with single numeric font and RS-232 output interface is about $6,900 in quantities of 10 or more from 156 Halpine Road, Rockville, Md. 20852.

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370/158 memory

COMPUTER MANAGEMENT
United Kingdom

World rank as DP market: *Fourth*
1975 DP expenditures (1): *$2.7 Billion*
1975 imports from US (2): *$270 Million*
Rank as importer from US: *Third*

Computer Management is a monthly magazine recently purchased by Computerworld, Inc. Monthly circulation is 30,000.

COMPUTERWOCHE
Germany

World rank as DP market: *Third*
1975 DP expenditures: *$3.7 Billion*
1975 imports from US: *$274 Million*
Rank as importer from US: *Second*

Computerwoche is a weekly tabloid newspaper started by Computerworld, Inc. It has a circulation of 21,000 to the West German computer community.

SHUKAN COMPUTER
Japan

World rank as DP market: *Second*
1975 DP expenditures: *$4.6 Billion*
1975 imports from US: *$189 Million*
Rank as importer from US: *Fifth*

Shukan is a weekly tabloid newspaper, jointly owned by Computerworld and Dempa publications. Circulation is 35,000.

Zero-Un Informatique
France

World rank as DP market: *Fifth*
1975 DP expenditures: *$2.5 Billion*
1975 imports from US: *$223 Million*
Rank as importer from US: *Fourth*

Computerworld represents **Zero-Un Informatique** in the U S. Zero-Un has three publications, one a weekly tabloid newspaper with circulation of 22,000, the second a monthly magazine, circulating 13,000 copies, and a new bi-weekly, Minis and Micros. All circulate throughout Europe's French speaking computer market.

DATANEWS
Brazil

World rank as DP market: *12th*
1975 DP expenditures: *$250 Million*
1975 imports from US: *$60 Million*
Rank as importer from US: *(Est) 10th*

DataNews is a bi-weekly tabloid newspaper in Portuguese with an English-language summary. It is owned by Computerworld, Inc. and has a circulation of 7,000.

Notes:

(1) These figures are estimates of International Data Corporation, the world's largest EDP Market research firm.

(2) Import figures come from the US Department of Commerce, and include only computers and computer-related products manufactured in the United States by US firms. Many US firms also manufacture abroad, and those products are not counted.

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MINIWORLD

Mini Bits

IMS Planning Workshop On Health Care Applications

CAMBRIDGE, Mass. – International Management Services, Inc. (IMS) is sponsoring a management seminar/workshop here on Nov. 8-10 for all medical, administrative, technical and DP professionals who expect to participate in minicomputer decisions or who will be affected by their use.

The seminar will provide a survey of products and applications available now and expected in the future. A basis for comparison will be given for evaluation of various products and techniques, IMS said.

Recommended management steps and firm guidelines based on experience will be included for analysis, design, selection and installation, IMS added.

Additional information can be obtained from IMS at 70 Boston Post Road, Wayland, Mass. 01778.

Ampex Extends Memory Line

MARINA DEL REY, Calif. – Ampex Corp. has extended its line of microcomputer core memories for microprocessor applications with the introduction of a single card module storing 1K eight-bit words and allowing data access within 450 nsec, the firm said.

The MCM-8300 is designed to operate in read-modify-write applications. Also available are 512- and 256-word versions, a spokesman noted.

Each memory module includes timing and control, data and address registers, decoding and drive circuits and a TTL-compatible interface, he said.

A data save feature is incorporated in the MCM-8300 to prevent loss of data under all conditions of power turn on/off or temporary power failure, he noted.

The MCM-8300 costs $180 in large OEM quantities. Ampex said from P.O. Box 33, Marina Del Rey, Calif. 90291.

Long-Line Adapter Supports RT11

TROY, Mich. – A long-line adapter from Systems Associates, Inc. is said to provide software and hardware support for high-speed communications under Digital Equipment Corp. RT11 operating system.

The LLA 400 hardware sends data up to 1.5 miles at 227,000 char./sec using a single cable, according to the firm.

Software support and direct memory access hardware operation allow networks of systems using Fortran and Assembly language programs to communicate with low overhead, the company said.

Two LLA 400s cost $9,000 for a basic system. Prices can range up to $60,000, the firm said from 55 Park St., Troy, Mich. 48084.

Xebec Has Controller

SANTA CLARA, Calif. – The 1000 series controller from Xebec Systems, Inc. is a microprocessor-based unit that allows the firm's memory peripherals to be connected to Digital Equipment Corp., Data General Corp. or Hewlett-Packard minicomputers, the firm said.

The unit was designed around Advanced Micro Devices' 2900 microcomputer.

The controller can be used with systems incorporating from 5M go 1200M bytes of disk, 12.5 to 125 in./sec magnetic tape and Persci double-density floppy disks.

A 300M-byte storage module incorporating the controller costs $25,000, Xebec said from 2985 Kifer Road, Santa Clara, Calif. 95051.

For Comprehensive System

Hospital Finds Mini/FM Mix Economical

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. – The combination of minicomputers and facilities management (FM) seems to be an economical alternative to a mainframe for the Georgetown University Hospital (GUH) here in its quest to implement a comprehensive health care and administrative system, according to the user.

The hospital is spending 26 months and a total of $250,000 for two Data General Corp. (DG) Eclipse C300s to implement an admitting-lab-pharmacy (ALP) system which is already partially up, according to Bruce Jones, assistant administrator for hospital services.

The cost of going with an IBM mainframe would have been two to three times greater, he noted.

Similarly, because of its "dire need" four years ago for DP expertise in a market in which such specialized knowledge was hard to come by, GUH elected to bring an FM firm, Compucare, on board to help it make the transition to automation without hiring its own DP staff, Jones said.

The overhead the 535-bed hospital would have incurred with an in-house DP organization is offset by the level of expertise obtainable from an outside contractor, he stated.

GUH is nearing the end of its 26-month ALP project. Since the planning for ALP began in August 1974, the university hospital has all patient admitting up and running.

Patient admitting includes a medical record index comprised of all the people who have come to the hospital as in- or outpatients in the last 30 years, Jones explained.

Patient admitting also consists of emergency and outpatient admitting and a disease and operative index, an important tool in a teaching hospital like GUH, Jones added.

Both the laboratory and the pharmacy aspects of ALP are still being implemented. The lab system is based on an older system supplied by Meditech.

Hematology is already on the system; each technician has a CRT that is interfaced, on-line to the coulter, the principle instrument in the hematology lab, Johnson said.

In January the pharmacy system should be up, he said. Among the pharmacy applications that will go on-line then are a unit dosage system; the scheduling of drug dispensing; profiles of patients' drug histories; billing of patients; schedules for loading drug containers; administrative schedules; and a drug product information file, an on-line desk reference similar to the *Physician's Desk Reference*, with information geared to the pharmacist, Jones explained.

Eventually, all 28 nursing stations in the hospital will be equipped with their own terminals which nurses can use to access lab and pharmacy data on their patients, Jones said.

The hospital is currently training its first nursing station for this operation, he noted.

Configuration Upgrade

In the next six months, the hospital will upgrade its configuration to include three terminals for every nursing station, Johnson noted. That will mean some 130 terminals – Data Media 2500 CRTs and Digital Equipment Corp. LA-36 Decwriters will be on-line to one Eclipse C300; a considerable jump from the 50 CRTs and printers now on the 356K-byte machine, he added.

Currently, 2M-byte disk drives interface to the C300 which operates under the Meditech Interactive Information System (Miis), according to Jones and Johnson.

Miis is a derivative of the Mumps operating system.

GUH relies on its other 256K-byte C300 for backup. The system has a 1M-byte disk drive attached to it. The CRTs operate at 9,600 bit/sec; the printers at 300 bit/sec, Johnson noted.

The nursing stations will need three separate terminals to perform three distinct functions, he said. Nurses will use a CRT to ask about a patient's status. One printer will turn out requisition labels for tests and specimen numbers for the laboratory.

Another printer will provide hard-copy printouts of the results of "stat" tests – those tests physicians order to be done right away, he added.

GUH's theory behind implementing ALP has been to add modules and applications to its system at its own pace and to buy computing space at a service bureau until it became economically feasible for the hospital to acquire its own equipment, Jones stated. With the end of getting ALP up and running in sight, the hospital's second big bite into facilities management – the reorganization of its patient billing system – has begun, he said.

By September 1977, GUH expects to complete conversion of its billing system from the 6 hour/day run time in batch mode on Georgetown University's IBM 370/145 to an in-house operation on a minicomputer, Jones noted.

The hospital will acquire "a C300-type CPU" for its billing system and anticipates making a hardware savings of $140,000/year by not renting batch time on the university's 370/145, he said.

(Continued on Page 41)

'Tough Teething' Over for Firm Hoping to Save $20,000/Year

By Esther Surden
Of the CW Staff

ELMSFORD, N.Y. – It's been a "tough teething process," but Stal-Leval, Inc.'s minicomputer is up and running and expected to save the company $20,000/year in salaries, according to Thomas Stott, president.

Unprecedented growth in the two-year period prior to the system's installation last December prompted the firm to look for an alternative to its manual way of doing business, Stott recalled.

The company, which supplies and services marine equipment for ships, was faced with a customer list that increased from 800 to 1,200 clients in that period. To avoid adding two more employees, the company considered minicomputers, time-sharing, service bureaus and even large-scale systems, he noted.

As the firm's growth rapidly advanced, so did the bulk of forms that had to be filled out for the Internal Revenue Service (IRS) and for the firm's Swedish parent company, Asea.

Quarterly reports that were "out of sync" with those required by IRS had to be developed for the Asea group and required a lot of the company's time, he noted.

Primary Requirement

A primary requirement for any mini installed was that whatever system the company chose, a separate DP department would not have to be set up.

"It became very clear that an interactive mini would be the way for us to go. We wanted it to assist the people that were doing the work," Stott said.

When the decision to go with a minicomputer was finally made, the firm "evaluated at least three [systems]. The principal reason we chose Mini-Computer Systems, Inc. is because it is right next door," he noted.

With the mini supplier in close proximity, the firm had quick access to programmers and maintenance. "There is a tremendous amount of interaction between their programmers and ourpeople,' Stott added.

Program development on the system "took a lot longer than anyone expected,' Stott noted, adding he'd advise anyone going into a small business system without packaged programs not to be overly optimistic about meeting programming completion schedules.

Stott also said he recommends the department heads work very closely with the programming personnel. Everyone thought "the computer can't do my work, it's too specialized"; that's the reason to get the higher management people involved with the system," he said.

"This is no time to assign a clerk to work with the programmers," he warned.

First-time users shouldn't depend on the minicomputer company to guide them either, he noted. "Guide the company; pin them down," he advised. Also, be aware that if different applications will be up at different times, the business will inevitably be out of phase and some 'catching up work' will have to be done. "Unless you don't put any applications on until that particular day, you'll have to cope with this," he said.

The system at Stal-Leval includes a

(Continued on Page 41)

Datum Has Controller for PDP-11

ANAHEIM, Calif. – Datum, Inc. has introduced an RK11D-compatible disk controller for Digital Equipment Corp. PDP-11 minicomputers.

The microprocessor-controlled unit interfaces up to eight drives with a total of 20M-byte capacity to the system, Datum said.

The 8-bit bipolar micro is said to provide fast I/O without allowing "bus hogging," it added.

Through firmware, the micro handles seek, read and write functions, read and write checks, control and drive reset, write lock and hardware poll.

Software interface between the controller and the Unibus is provided by programmable hardware registers.

Called the Model 4091 (E), the unit accommodates two daisy chains, each with four single-density and 2.5M-byte drives. It can also service four dual-density 5M-byte disks in a double daisy-chain configuration, the firm noted.

The control prices begin at $2,900, Datum said from 1363 S. State College Blvd., Anaheim, Calif. 92806.

System's Jobs Range From Accounting to Biorhythms

By Esther Surden

Of the CW Staff

CLEARWATER, Fla. – A small business system at Rockley Research Academy here is giving this management information firm the data it needs to help its clients increase sales and profits, according to Dr. Graham C. Rockley, president of the company.

"We offer a comprehensive service" to professionals such as lawyers and doctors that encompasses everything from doing their accounting, writing payroll checks, maintaining client lists, taking care of mailings and printing labels, preparing statistics on their practices and doing biorhythm charts, Rockley said.

"We are primarily concerned with motivating our clients to increase sales and profits," Rockley noted, adding the IBM System 32 helps because it provides the kind of management information the practitioner, who is not a businessman, needs.

But "we find in business, people get demoralized by figures; the biorhythms provide an area of fascination to get them away from logic. We try to motivate people to get away from the usual."

The system at Rockley Research "gets a fair workout," he reported. It is a 16K System 32 with 5M bytes of disk, a 155 line/min printer and a 3741 key-to-diskette unit.

About 100 private practices are accommodated on the system. In addition, the firm deals with 2,500 other businesses that do not receive the comprehensive service.

Rockley became involved with computers through his son, who knew Fortran. He became acquainted with the IBM system after considering an IBM 3 and buying some time on an 1130 at a service bureau.

The System 32 seemed to be just what was needed for his business, he said. "Of course, I had to reorient myself to RPG-II," he added.

All the software for the system was written by Rockley himself.

"We have over 300 large programs in our library," he added, "which is quite a few for the small system, and we plan to upgrade our disk to the largest available, 13.7M bytes."

Firm Saves $20,000 After 'Tough Teething'

(Continued from Page 40)

65K-byte Micos CPU, 10M-byte disk drive, two CRTs, a 330 char./sec printer and applications software. The hardware cost $55,000 and the software $20,000, according to Stott.

Customized software was necessary because many of the company's applications were unique because of their subsidiary status," Stott explained. "[The vendor] had to tailor everything to our needs," he said.

System Applications

The system is being used for purchase order processing, order tracking, invoicing, inventory control and general accounting, Stott said.

A U.S. company could order a part for one of its ships which is located anywhere in the world and the system keeps track of where each part is to be shipped, he explained.

The CRTs are located in the service and accounting departments. When the firm receives an order, the firm's vendor numbers and customer numbers are entered into the system.

Inventory is checked to see if the item is in stock. If not, the information in the system is used to produce a purchase order, Stott explained.

After the acknowledgement that a purchase order has been placed comes back from the vendor, that data is entered into the system and used to produce the final invoice, he added.

At shipping time, the destination and shipping charges are added: The data then becomes the territory of the accounting department as an accounts receivable.

"We get involved in five different currencies and once a week we have to change exchange rates. The system computes the price of U.S. dollars and prints out the invoice," Stott explained.

The quarterly reports produced for the parent company not only are due at different times than the IRS reports, but also must be reformatted to be compatible with the company's mainframe.

Hospital Mixes FM With Minicomputers

(Continued from Page 40)

Outpatient receivables and collections will be brought in-house by February or March. Serving 50,000 outpatients a year through 45 clinics, the hospital currently dumps all of the charges from these areas into the 370/145 on tape, he indicated.

Cost, Control Benefits

Not only will conversion from the large mainframe bring cost benefits through hardware savings. but the hospital will also gain in-house control of its billing system which will be connected with the ALP data base, Jones explained.

The Miis operating system was a major criterion for the hardware the hospital selected, he added. No large mainframe operated under that software. The hospital focused its attention on DEC and DG minis, in particular examining machines from DEC PDP 15s and DG Novas all the way to DEC 11/70s and DG Eclipses, Johnson continued.

In the end, the Eclipses came out faster and cheaper. Johnson described the hospital's evaluation of the machines as "very competitive," and noted the facility would have been happy with two DEC 1170s as an alternative to the C300s, if it weren't for the very attractive price difference favoring the Eclipse systems.

The hospital tested the Interpretation speed of the Miis code rather than disk accessing time, Johnson said. The Eclipse C300 was "marginally faster than the comparable DEC machine and it hadn't even been updated to run the Eclipse instruction set; it was operating under Nova code," he stated.

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Policy Directive Urges Services

OMB Wants Federal Agencies to Give Up DP Centers

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – Congressional concern about the apparent reduction in competitive government DP procurement in recent years [CW, Aug. 2] has been heightened by a policy directive that calls for abandoning government DP centers in favor of contracts with commercial DP service firms.

The directive, circulated for comment by the Office of Management and Budget (OMB) is a supplement to OMB Circular A-76, issued in 1966.

Circular A-76 suggests ways for government agencies to increase their reliance on commercial establishments to meet DP requirements whenever possible.

Rep. Jack Brooks (D-Texas), chairman of the House Government Operations Committee, fears the supplement to A-76 favors the services sector of the DP industry over those sectors engaged in marketing hardware, software and maintenance services.

In a letter to OMB Director James T. Lynn, Brooks pointed out the supplement instructs agencies "not to make cost studies unless the agency has reason to assume in-house costs will be significantly less than competitive commercial prices."

The effect of this provision is to force government agencies to favor the commercial services sector even if that will cost more than acquiring equipment, he indicated.

The adoption of the A-76 supplement could also "undermine the efficiency of government agencies," he said. "If the supplement is faithfully adhered to, agencies will not even have the opportunity to weigh the loss of nonfinancial needs against alleged cost savings."

Concern About IBM Share

Members of the House Government Operations Committee have learned that although the government's inventory of DP equipment as of last year averaged 30% IBM, commercial facilities averaged 70% IBM, according to a committee spokesman.

Rather than increasing competition among mainframers whose systems are being used for government data processing, use of commercial services could actually reduce competition, he said.

Circular A-76 received little notice from most agencies because the OMB never attempted to enforce it, according to consultant Terry Miller, president of Government Sales, Inc.

The supplement, however, not only suggests how and when to contract for services but goes so far as to indicate how to phase out an entire DP operation and hire an outside contractor "without loss of vital services," Miller noted.

Further, it requires agencies to change their accounting procedures when estimating the cost of in-house DP operations by charging 28% of staff salary overhead – a figure Miller said more accurately represents the government's fringe benefits and retirement plan – instead of the previous 7%.

Previously completed government cost studies are believed by many not to have been economically valid, according to Miller.

Directive Requirements

In keeping with the overall objective, the directive requires agencies to review all government DP facilities by September 1977 to determine whether they are justified under the "exception criteria" of A-76.

If they are not, presumably they will be required to be phased out. The only justifications the OMB accepts for maintaining an internal DP facility, according to regulation A-76, occur when:

- Procurement of a commercial service would disrupt or delay an agency's program.
- It is necessary for purposes of combat support, for retraining of military personnel or for maintaining or strengthening mobilization readiness.
- A satisfactory commercial source is not available and cannot be developed in time.
- The product or service is available from another federal agency.
- The product or service from a commercial source costs more.

The policy directive, signed by Lynn, noted that under the service approach an agency's role would shift from "performing" the DP function to "managing" the DP function. However, rather than eliminating the need for in-house DP expertise, expertise would be required "at a level necessary to prepare service and performance specifications" and then "monitor performance of commercial services."

Development and software people could be eliminated through "attrition," the OMB said.

If the measure becomes public policy, agencies with plans to "initiate, expand, upgrade, replace or modernize" DP functions would be required to review their needs and, if current DP activities could not be justified under A-76, they "shall be terminated in a planned and appropriate manner."

Multiyear Plans Due

Agencies would also be required to prepare multiyear plans for the OMB by next spring indicating which functions will be performed in house and when the agency will rely on private sector services.

By Nov. 10 – less than a month away – agencies must develop a program outline with specific in-house DP areas targeted for replacement by services, according to the directive.

As for acquisition guidelines, agencies are expected to begin immediately to express all DP requirements in terms of

(Continued on Page 44)

Had Right Track, Wrong Horse

IBM Planners Foresaw Plug-Compatible CPUs

By Molly Upton
Of the CW Staff

NEW YORK – As early as 1970, IBM's Market Evaluation Department was concerned about the technical proficiency of the Japanese and foresaw plug-compatible CPUs, according to its "Study of the Semiconductor Manufacturer in the 1970s" recently introduced into evidence in the U.S. vs. IBM antitrust case.

Gazing into its 1970 crystal ball, the department had the right track but the wrong horse. It foresaw the development of a plug-compatible CPU either by the Japanese or by an American semiconductor manufacturer.

It also foresaw large-scale integrated circuits playing an increasing part in total systems cost and the trend by mainframers to develop their own LSI manufacturing proficiencies.

And it predicted that Texas Instruments, Inc. (TI), which it used as its example for the study, was likely to enter the general-purpose commercial systems business.

TI had the capability of offering "plug-compatible processors" which "operate under IBM's 360 system control programs and are designed to IBM's interface at the I/O channel level," the report said.

IBM Trial Documents

The IBM report said TI was "the semiconductor manufacturer with the best chance to achieve a significant position in the DP marketplace."

TI, according to the script, would probably announce its entry into the general-purpose market in the 1974 timeframe.

While the IBM report did not specify whether the CPU expected from TI would be 360- or 370-compatible, it is likely IBM was thinking of a 370-type machine.

Sources confirmed 80% to 90% of the design could be completed based on 360 principles of operation, and 370 operating principles were available either at the time the report was written or shortly thereafter.

In the report, IBM said that although there would be challenges presented by a weakness in TI's marketing area and the rapid buildup in its DP operations, TI could conceivably manage shipments in the $300 million to $400 million range by the end of the decade.

"In summary, the biggest of the semiconductor manufacturers could become a company to be recognized in the marketplace in the 1970s, but not one of the major manufacturers of DP systems, at least not through internal growth."

"The Japanese, late in entering the DP industry but major users of vanguard semiconductor technology, are undoubtedly keeping close tabs on the pros and

(Continued on Page 44)

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Software Firm, Distributor Unite

NEW YORK – A merger between Computer Associates International Ltd. and its former distributor, the Software Products Division of Standard Data Corp. (SDC), provides each firm with a marketing vehicle for its products in both the U.S. and Europe.

The firm resulting from the merger, Computer Associates, Inc., will be responsible for all product activities in the western hemisphere, according to Charles B. Wang, president. Wang was formerly vice-president of SDC.

Computer Associates International has offices throughout the continent and is known in the U.S. as source of the CA-Sort package. It will market SDC's products, which include Symbug and Idos/VS, in Europe.

Expected total revenue worldwide as a result of the merger should exceed $5 million, according to Sam Goodner, president of Computer Associates International.

IBM Planners' Script in 1970 Foresaw Plug-Compatible CPUs

(Continued from Page 43)

cons," the IBM report stated.

"Their interest would be twofold," the report observed, "displacing IBM equipment in Japan and establishing themselves in the worldwide marketplace.

"Instead of competing as a systems manufacturer, they could compete as a plug-compatible CPU manufacturer, with their principle thrust in the U.S. probably coming through a third party with an established marketing organization marketing their systems.

"Once again, this would marry their technology skill with someone else's marketing skill. That someone might be an RCA, which has already demonstrated willingness to develop a complete 'intercept' strategy based on System 360 simulation and might be receptive to go one step further to offer a truly 'plug-compatible' processor line.

"Or it could be a Telex or a leasing company – organizations which traditionally have supplanted the original seller by offering users the same product capability at lower cost," the report said.

IBM predicted compatible processors because it recognized there was enough 360 technical information "now in the public domain to clearly indicate the architectural characteristics of the processors to which IBM's system control programming is keyed."

The report also observed that microcode programming gave designers great flexibility in "offering the user something IBM has not offered; e.g., the freedom to run the processor under any microcode he desires – and to change from program to program under machine control."

Why would a semiconductor house enter the CPU area? To improve its margins and to compensate for lost revenues as mainframers developed their own LSI capabilities, the IBM planners said.

Because LSI design requires a very close working relationship between the component and systems designers, the mainframers would develop their own LSI capabilities, IBM predicted.

Semiconductor makers could compensate for this revenue loss and improve their margins by using their systems design capability to manufacture DP equipment for the end user, IBM said.

OMB Wants Agencies To Use DP Services

(Continued from Page 43)

services to be performed rather than equipment to be procured.

States should allow the service vendor "flexibility in equipment and people as long as satisfactory services are provided," the OMB directive said.

All delegations for procurement authority requested from the General Services Administration for obtaining DP equipment should indicate why A-76 does not apply.

Feasibility studies to determine whether a commercial DP activity can be cost-justified should be limited to situations where there is reason to assume in-house cost will be less than competitive commercial prices, the OMB suggested.

Commercial sources would be favored especially when equipment and requirements would become obsolete after a very short time, the OMB said.

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UCC Looks to Bright Future After Demise of Datran

By Toni Wiseman
Of the CW Staff

DALLAS – University Computing Co. (UCC), rid of its financially impoverished sister firm, the Data Transmission Co. (Datran), has ambitious plans for the future, including the expansion of its role in the software package market.

Several weeks ago, when UCC's parent firm, Wyly Corp., announced its intention to dispose of Datran, UCC concurrently announced it had taken out a $4.1 million loan in order to underwrite Datran financing while Wyly was seeking a potential buyer or investor, according to Mike Harvey, president of UCC's U.S. Group.

The mere fact that the bank lent UCC the money points to the group's financial stability, Harvey said, "since banks don't make loans unless they expect to be repaid.

"And our only means of repaying a loan, as the bank knows, is almost totally out of operating profits since our hardware is on long-term lease and we don't represent a large amount of tangible assets," he said.

"To be candid, [Datran's closing] is a benefit to us because a great many people in the marketplace have looked at UCC as the primary source of the financing of the start-up of the debt and what this does is cut that off as a future financial drain," Harvey stated.

Three Divisions

UCC's U.S. operations are separated into three divisions: Commercial; Scientific and Engineering; and Banking.

"Our concept of our business is that there are two things that set us apart from our competitors," Harvey said. "One is proprietary software and the other is the quality of our service.

"In my concept, the combination of those two really form a nucleus and the various distinctions between the divisions really become simply different ways of delivering service and software to our customers," he said.

One way to deliver is to sell software as a package, another is to offer it over a communications line as a service and a third is to take over the complete management of a customer's data center on a facilities management basis and run UCC software on its computer, Harvey stated.

"In other words, what we really try to do in our product planning is define all the ways a product can be delivered to a customer as one of the decision criteria on that product," Harvey noted.

UCC's Commercial Division develops, packages, supports and sells software for IBM systems as well as a commercial version of a financial control package.

The division has 700 to 800 medium to large IBM equipment users who have purchased packages and some Burroughs users, he said.

Of the eight systems software and one financial packages, a number rated very high on the Datapro honor roll, Harvey noted, adding one has been on the roll for the last two years and one for three years.

The bulk of the Scientific and Engineering Division's business is centered in remote batch computer processing.

From a data center here comprised of five Univac 1108s and a Control Data Corp. 6600, the division operates over a nationwide network servicing a variety of high-speed remote terminals in customer and UCC offices.

UCC-developed applications such as data base management and numerical control are available to the division's 1,000 customers along with proprietary software UCC has acquired under royalty agreements with other vendors.

The division also sells raw computer time, Harvey added.

This year the Scientific and Engineering Division has also been developing packaged software versions of the programs it runs as services in order to provide them as packaged licensed products, he said.

The Banking Division is really a combination of the first two divisions, Harvey said.

As well as servicing the banking industry with two data centers – one in Michigan and a smaller one here – the division offers software on a facilities management basis to small and medium-size banks.

Another part of the division is involved with the sale of proprietary UCC banking software packages covering such applications as commercial loans, installment loans, magnetic ink character recognition and customer information files, he said.

While UCC's European Group operates separately from the U.S. Group, the two have a fairly close relationship, Harvey said.

The International group is broken into two major operating entities, one based in Great Britain and the other in Switzerland.

The UK operation closely approximates the U.S.' scientific and engineering services, he said, while the Swiss operation consists primarily of computer services and its business is more commercially oriented.

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When It Comes to Make-or-Buy Decisions

Total In-House Manufacturing No Longer Makes Sense

By David I. Caplan
Special to Computerworld

Vertical integration, once touted as the ultimate objective of young companies in the computer industry, is not necessarily the best way to go these days.

In light of the fast pace of technology; the increasing need for specialization and the limited availability of resources, I believe today's aspiring young computer peripheral companies should be taking a fresh look at the question of how much inhouse manufacturing is appropriate.

We have been doing that at Inforex this year and anticipate this will allow our future products and services to be even stronger and more flexible.

There was a time when it did make sense to do everything inhouse. For example, six years ago when Inforex needed a particular set of technical performance capabilities and product costs for its disk and tape drives, the best solution to satisfy both cost and availability factors was to design and build them inhouse.

Today it is unlikely we would even consider developing an electromechanical peripheral. Much of the terminal-based system we are planning for the distributed processing market will be purchased from an outside vendor.

Times Have Changed

Times have changed, and in questioning vertical integration today we find the answer is sometimes not the same.

First, there are now many OEM suppliers for the various peripherals we build into our data entry systems. They are usually very good at what they do because they have focused on their particular specialty. Their volumes and skills allow them to offer peripheral products.

Secondly, by watching closely the technological progress and direction of these vendors, we can stay more flexible with our own product lines while letting the OEMs take the risks attendant with leading-edge technology.

We therefore can avoid reinventing the same wheels that half a dozen outside vendors are busy perfecting, leaving our resources available to focus directly on developing total data entry systems.

Thirdly, in carefully analyzing total life cycle product costs, we have seen a much broader set of criteria emerging.

Traditionally, a make-or-buy decision – and therefore the whole question of vertical integration – hinged on a relatively simple analysis of manufacturing costs.

That's just not so today. Of far greater importance is the vast array of costs that will be incurred over the many years the product will be on the market.

These include our incoming inspection, inventory spare parts and field service costs.

Remarketing costs are also a factor in later years, not to mention the ongoing accounting support that a lease base requires. So the original manufacturing cost could be as little as 20% of the total cost picture.

Also, this approach should provide flexibility in both cost and/or product improvements, especially needed during a system's mid-life, when competitors' newer offerings often are more price-competitive.

End Result Important

It is extremely important to keep a sharp focus on one's primary area of business.

Customers are less concerned about how we bring together the various building blocks in a system as long as the system gets the job done in a reliable, timely manner.

What added value will there now be for Inforex? There are several answers to that. First, let me stress we are not categorically moving away from vertical integration.

We are simply adopting a much more critical approach to cost analysis, and our make-or-buy decisions will be guided by a broader array of economic and technical considerations. There is substantial value added in this approach.

More important, we will contribute our expertise in marketing, field service and customer support.

While we will continue building a certain portion of our subassemblies in-house, it is in the area of software development that we will have the greatest value added.

We feel it is particularly important to maintain a strong logic design capability.

Advances in semiconductor technology can be of benefit if we buy chips and design them onto boards ourselves.

Caplan is vice-president of engineering at Inforex, Inc.

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With the DECSYSTEM-20 this

CA Flexing Market Muscles After Record Sales Year

By Toni Wiseman

Of the CW Staff

IRVINE, Calif. – Looking back on a $30 million year, Computer Automation, Inc. (CA) is optimistic about the future, particularly since it feels strong in all areas necessary for success – financing, hardware and marketing.

The mini maker shipped over 5,000 minicomputers in 1976; has averaged 70% growth over the last five years while the industry had an overall compound growth of 33%; and reduced its debt to zero.

CA has three operating groups: the Naked Mini Division (NMD), which serves OEMs' needs; the Commercial Systems Division (CSD), which markets the Syfa distributed processing system to end users and OEMs; and the Industrial Products Division (IPD), which designs and builds automatic test systems for circuit boards.

CSD is probably the most exciting part of the company at this point, according to David H. Methvin, CA's president.

Dealing in dispersed data processing, it has adopted the corporate stance of marketing only to big blue chip companies, he said, noting this amounts to a potential $1.5 billion market this year.

"Our growth in this area is limited not by the market but by us," Methvin said, "so we can grow at will until we get a large portion of the market because there is room for a lot of people.

"It's an area in which we're picking up a piece of the growth rather than having to carve out a piece of someone's hide."

IPD, on the other hand, expects to "push over some guys in the marketplace," he said.

Finances and Growth

CA is proud of its financial record and its growth from $21 million in sales last year to this year's record $30 million.

"We've grown on our retained earnings and we're currently the only minicomputer company which pays a dividend," he added, noting the dividend is significant not because of the amount, but because it means CA is not "in for a quick buck but is planning for the long range."

CA's corporate philosophy is to undersell its products, Methvin said: "That way the user is happily surprised when he discovers the extra capabilities.

"We also believe in high profit margins to enable us to grow and support our customers," he said.

To date, CA has grown without acquiring any new companies, but that avenue of growth is still open, Methvin admitted.

David H. Methvin

"Being in a market as large as ours is and growing as fast as it is, we've had our hands full with our own growth up until the last couple of years, so we didn't need to go outside.

"You need excess management to acquire a company and we didn't have a surplus. We also didn't want to acquire a company which had a lesser growth potential than we did because we didn't want to dilute ourselves.

"Now we believe we have sufficient strength in management and financial resources to take on the risk of an acquisition, and we have the distribution that makes acquiring peripherals more attractive and meaningful," he said.

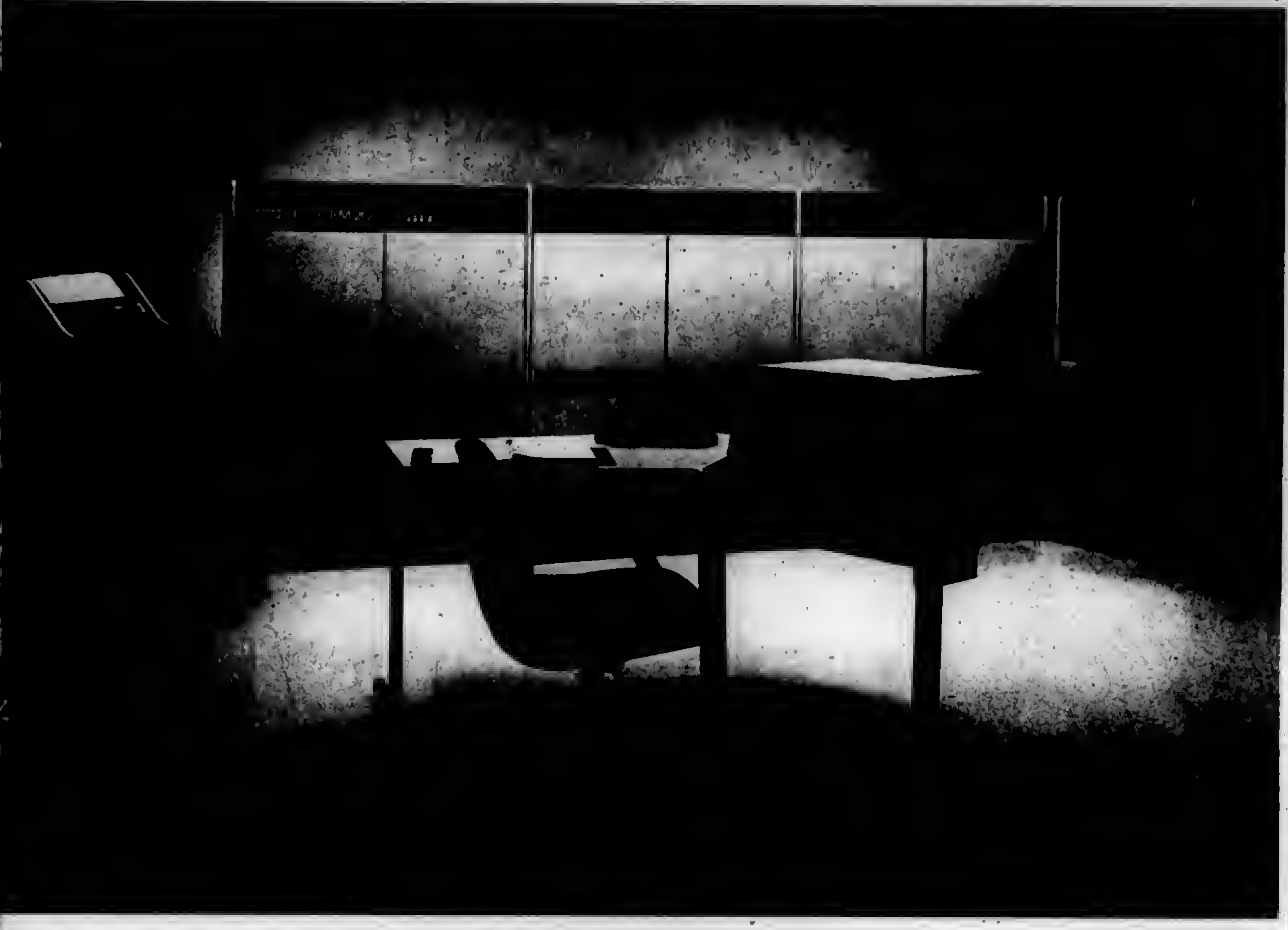
Methvin added, however, that he doesn't foresee adding any new divisions this year.

CA markets only to the "volume sophisticated user" in all three of its product areas, Methvin stated.

The users must be sophisticated both in terms of computers and the business they are in, he emphasized, since CA will not customize its products, provide any application software or supply turnkey systems.

"We simply will not sell a Syfa to a first-time user or the guy who wants only one. We don't want to be in the hand-holding business.

Instead, we market to large insurance companies who are sophisticated and buy in volume," he said, adding he had once gone so far as buying back a computer a salesman had sold singly.



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On 'Selective' Basis

ICCL to Supply Singer Users in Canada

By Esther Surden
Of the CW Staff

MONTREAL – International Computers of Canada Ltd. (ICCL) will be supplying Singer hardware in Canada, including parts for Singer System Ten, 1500 and point-of-sale (POS) units as well as some new systems, ICCL President T.W. Randall said in an interview here.

"We will sell all of those product lines on a selective basis," he said. "Selective" implies the firm is not going to sell equipment in geographical areas where it cannot be maintained, he indicated.

"As far as Singer users are concerned, the main issue is that their investment here in Canada has been salvaged and maintained; they now have someone to supply them parts," he said.

The firm doesn't intend to get into the same bind as Singer, Randall said, and plans to sell hardware to new users without providing the support first-time users really require.

First-time users will have to seek software help elsewhere, Randall said. TRW is maintaining Singer equipment in Canada.

There are more than 100 System Ten users in Canada, representing a possible $1 million in add-on and future sales and POS and intelligent terminals could bring the firm an additional $1 million each, he estimated.

"All along we have kept a low profile; we will not rock anyone's boat. While we always had the marketing right, we didn't know what the rules were," Randall said.

The rules have since been clarified, he noted, and thus the company will enter the Singer marketplace.

Singer users in Canada are extremely nervous, he said, because they received a letter notifying them that consulting from Singer would cost $45/hour and on-site help would be $100/hour.

International News

ICCL's entry into the Singer marketplace will help alleviate some of that nervousness, Randall indicated, because some consulting will be available from ICCL, although the firm will not provide turnkey services.

ICCL has been in business in Canada for almost two years and has shipped an average of one system per month. Its primary product is the 2903 system, which has been described by some as a supermini; the 2904 will be introduced in Canada shortly.

Algerian Boom Expected

ALGIERS, Algeria – A plan by this nation to double the value of its installed computer base to $120 million over the next five years should be viewed as a boon by mainframe manufacturers, according to *Computer Weekly International* (CWI).

Many of the installed computers are second- or old third-generation machines, CWI noted.

The total value of the installed base is estimated at $50 million; "as well as doubling this figure over the next five years, Algeria expects to take the value of installed machines up to $250 million by 1985," the article said.

The predicted rapid growth of the installed base was attributed to the equally rapid economic growth of the country.

Proposed applications include industrial and economic development, agriculture, telecommunications and service areas as well as the development of a national information system.

ICL Designs CRT For Iraqi Users

LONDON – International Computers Ltd. (ICL) has developed an Arabic version of the 7502 modular intelligent terminal system in a project underwritten by the government of Iraq.

The ability to display Arabic characters is becoming an indispensable requirement for the rapidly expanding Middle East market; the development is a comprehensive one, including two traditional character sets and the standard set recommended by the Iraq National Computer Center, according to *Computer Weekly*.

The Iraqi character set is a simplified and formalized version of the traditional script with fewer variations for each character.

The major problem faced by ICL was that – although the Arabic alphabet has only 29 characters – the conformation of most characters varies according to their position in a word and depends on the letters preceding and following it.

ICL has developed a set designed for a 12 by 7 dot matrix screen, a higher level of definition than the standard 7502 screen.

The system also allows connected script to be displayed, making it easier to read.

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Tran Basing Business Philosophy on 'Actionary' User

By John P. Hebert
Of the CW Staff

EL SEGUNDO, Calif. – Data communications, as opposed to data processing, "is just now coming into its own," J. Robert McConlogue, vice-president of marketing at Computer Transmission Corp. (Tran), said in a recent interview here.

Users are beginning to take a look at network arrangements and the dollars spent on those arrangements; they are taking an overview and beginning to plan, McConlogue said in observing the advent of an "actionary" rather than a reactionary user stance.

In keeping with that description of data communications, he noted users are the main factors in change at Tran.

"We try to develop a 'we're in this with you' relationship to understand the users' future requirements. It is our present mode of doing business," he said.

To avoid designing obsolescent systems, "we provide more than just black boxes. We like to look at ourselves as a network house," McConlogue said.

Accordingly, the bulk of activity and energy within the company has focused on Tran's Pacuit M3200 network switching and management system, McConlogue said.

Pacuit will also be a major part of the company's activities in the future, McConlogue noted. People are going after intelligence in networks to take the processing load off the CPU for a maximum utilization of communications facilities, he said.

Pacuit was billed as the present evolution in a product line which began at the company's inception in 1969.

In the past, the Model 2100 Multitran time-division multiplexer was the main product. It was superseded by Tran's line of local distribution equipment, which in turn was superseded by the M300 asynchronous circuit switcher capable of switching multiplexers to each other.

Now Tran is providing the capability of a transparent network for both packet and circuit switching through different protocols to compatible devices, he said.

"Users are more interested in multiprotocol capabilities in networks. That whole issue is mired in gray because of political and business reasons.

"The entire communications environment is searching for future protocols and standards," McConlogue said.

"We would certainly support Europe's CCITT settling on X-25 as a worldwide standard, although a lot of that depends on what Bell does," he added.

The Pacuit format will come down to the smaller users eventually and this is where the common carriers will become involved, he predicted.

Users can be partitioned, although their facilities would appear to them as their own private system. Small users will therefore have the potential of becoming part of the larger community of users, according to McConlogue.

Tran's sales orientation, in the past and for the future, he admitted, will be toward large manufacturing firms – large companies with spread-out facilities – because they are the users with large requirements and large networks.

The future in data communications and the way in which the minicomputer- and microprocessor-based networking capabilities come down to the medium-sized and smaller users depends on what steps the common carriers take in providing a data service much like voice service – in other words, a service with worldwide access, he said.

There has been no significant change in the company's pricing structure over the past year, he said, adding that could happen when technological advances bring faster and cheaper microprocessor units.

For the present, Tran has identified its product niche in response to a particular need.

Contracts

System Development Corp. has been awarded a $2.5 million support contract by the U.S. Navy Electronics Laboratory Center for systems analysis and computer program development support in such areas as command and control, intelligence DP, communications systems and management information systems.

Chilton Corp. has signed a $750,000 contract with the Credit Bureau of Oklahoma City, Inc. for automated consumer credit-reporting services.

Kennedy Co. has received a two-year $550,000 contract from Texas Instruments (TI) for the use of Kennedy's Model 9700 tape transports in TI's data communications interfaces.

Computer Network Corp. has awarded a contract from the U.S. Navy Bureau of Personnel for the development and operation of an advanced manpower information system eventually covering all personnel operations for the Navy.

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Systems Installed: More than 100
Configuration: Works with any on-line system.

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Simultaneous with data transfer	Yes
In networks with multiplexers, concentrators	Yes
English language display	Yes
Real-Time line level monitor	Yes
Remote site assistance required	No
Meters, oscilloscopes required	No
RESTORAL	
Bypass line failures	Yes
All automatic at remote sites	Yes
Dial backup at all speeds 1200 baud-9600 bps	Yes
On-line spare modem	Yes
OTHER FEATURES	
Secondary Channel, simultaneous with data	Yes
Port Sharing	Yes
Modem Sharing	Yes
Bridging, analog and digital	Yes

London Seminar Set

LONDON – A seminar devoted to marketing to the U.S. telecommunications industry will be held here at the Royal Kensington Hotel Nov. 17-18.

The seminar, sponsored by the market research firm of Frost & Sullivan, will include sessions on selling equipment and services to the U.S. Fortune 500, to the newer common carriers, to the residential and small business marketplace and to the Bell System.

Other sessions will deal with the U.S. regulatory arena, telecommunications technologies and the effective use of distributors.

The U.S. telecommunications industry offers several advantages for foreign suppliers, according to Harry Newton, a seminar speaker.

Registration for the seminar is $350. Further information is available from Bob Sanzo, Frost & Sullivan, 106 Fulton St., New York, N.Y. 10038.

Levied by California

Services Firm Battling Keypunching Tax

By Molly Upton
Of the CW Staff

SUNNYVALE, Calif. – Intellidata, Inc., a consulting, programming and keypunch services firm, is fighting a $29,000 sales tax levied retroactively for revenues from its keypunch services.

Under California statute, keypunching and key-to-disk services are taxed as "fabrication services," just as sheet metal is, according to R.J. Carpenter, president of Intellidata, who became aware of the statute six years after founding the firm.

Carpenter feels the DP industry needs organizations within each state to act as lobbies. He is concerned there may be others who may be as naive as he was about such state tax legislation.

Intellidata spent several weeks sorting out its income received over the past six years into various categories, such as straight keypunching, straight programming, programming and keypunching and miscellaneous, he said.

Carpenter's interpretation of the law is that programming is not taxable if presented to the client in the form of coding sheets; once it is keypunched, however, the keypunching services are taxable, he explained.

But the local representatives of the State Board of Equalization, in a hearing on Intellidata's case, indicated the firm should pay sales taxes on all work performed for any client for which it also provided keypunching services.

This includes such services as consulting, which in no way involves keypunching, Carpenter said.

Carpenter attributed the distinction to the similarity between preparing a program on coding sheets and the work of accountants and lawyers, which have some weight in government regulations.

"In areas of taxation, I think California tends to be a leader," he remarked.

The next step for Intellidata is to meet with a legal staff member of the State Board of Equalization and then, if necessary, the board itself, he said. The board is comprised of five elected officials and the state controller.

If Intellidata loses that round, it is prepared to pay the tax and sue the state to recover the payment, Carpenter said.

"I think they're setting up a test case," he added.

Orders & Installations

Merrill Lynch, Pierce, Fenner & Smith, Inc. has ordered 57 printer terminals from Genesis One Computer Corp. The terminals will be used in an inventory system for control of the firm's on-hand securities and other negotiable items.

The Founders Society of the Detroit Institute of Arts has installed a Burroughs B1714 system for museum membership and campaign development applications.

Avard/Garth, a California institutional food distributor, has installed a Univac 90/30 system for order entry.

The U.S. General Services Administration has ordered magnetic cartridges and cards from the 3M Co.

United Airlines has ordered Incoterm Corp. intelligent terminals under a multiyear master purchase agreement valued at about $1.5 million. Equipment on order includes Model 304 terminals equipped with Type 5 badge readers and 80-column card readers, SPD Series 20 clustered intelligent terminal systems and SPD PRP-45/200 printing reader/punches.

Montana State University at Bozeman has ordered a 32/55 system for concurrent heat exchanger data acquisition and real-time simulation from Systems Engineering Laboratories, Inc.

The California State University and Colleges system has installed a Control Data Corp. Cyber 173 for its statewide timesharing student education network.

Ford Motor Co. has ordered a PIX II network including two local I/O sets and seven remote I/O sets and peripherals from Paradyne Corp. The order is valued at $1.3 million.

Rocky Mountain Bank Note Co. of Denver, Colo., is installing six key-display systems from Mohawk Data Sciences Corp.

The *New York Post* has ordered a Model 2550 copy-processing system from Harris Corp.'s Composition Systems Division, the first phase of the paper's shift from hot metal to cold type production.

Ambassador International has installed a Honeywell 66/40 system to handle catalog sales and contract mailing services.

Aeroject Nuclear Co. has installed a Control Data Corp. system including a Cyber 76 and a Cyber 173 to handle the scientific workload at the Idaho National Engineering Laboratory.

Gulf Coast Machine and Supply of Beaumont, Texas, has ordered an NCR Criterion 8550 system for on-line order entry and inquiry, raw materials control, production control and general accounting.

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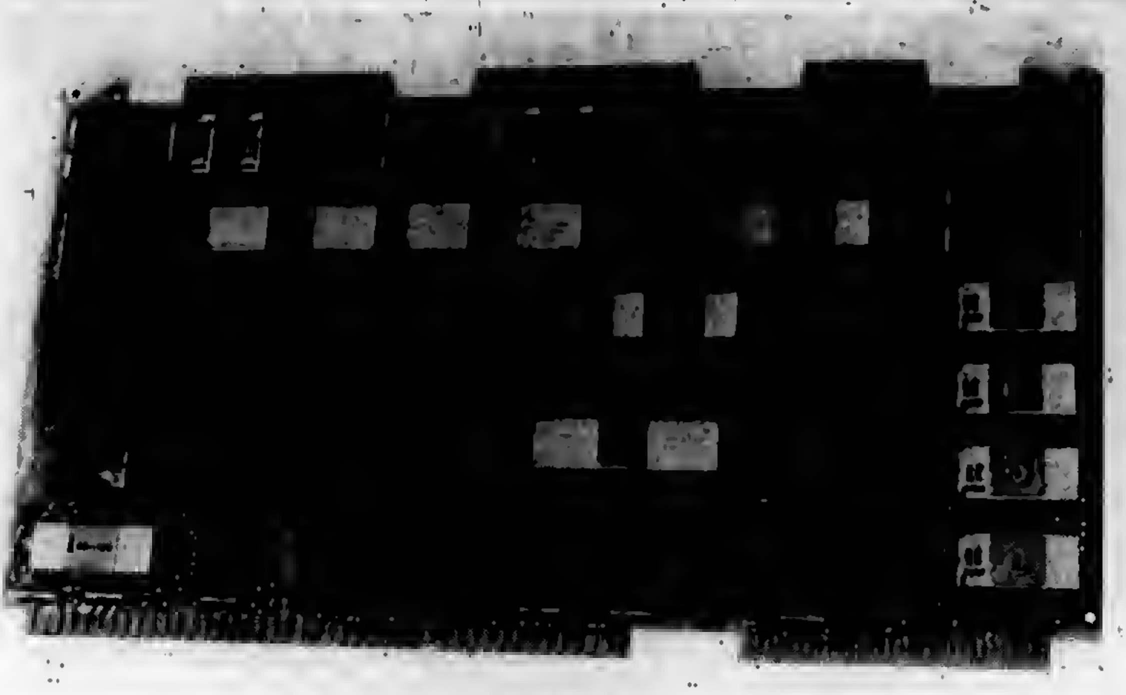

Intel Corp. 80/20 Single-Board Computer

Intel Adds Resident Compiler, Modular Programming to 8080

SANTA CLARA, Calif. – Intel Corp. has unveiled a PL/M compiler resident on the Intellec microcomputer development system and Isis-II, a diskette operating system included with the diskette system hardware:

Together they comprise a software system comparable to library systems sometimes used to prepare applications programs for larger computers, Intel said.

Support software can automatically link program modules to form an applications program, the company added.

The system supports programming of Intel 8080 microcomputers, the SBC 80 single-board computer systems and other products based on the 8080A CPU, the firm said.

The system allows designers to use different source languages for different modules with assurance that object code will merge properly and easily, Intel said.

Supports Modular Software

The latest PL/M compiler fully supports modular software design by generating linkable and relocatable object code modules, Intel said.

These modules can be automatically joined to each other or to object code modules by a relocating macro assembler contained in the Isis-II package, Intel said.

Previous PL/M compilers lacked this capability, a spokesman said, adding the previous 8080A PL/M compiler was a cross-compiler requiring a larger CPU or a time-sharing system; the latest one runs on the 8080A itself.

Software designers can use either PL/M or the 8080 system Assembly language for the individual modules.

In addition, the programmer can define data structures and also access absolute addresses, Intel said.

The Isis-II includes all the other subsystems required for modular programming such as an updated macro assembler, linker, locator and library manager, according to Intel.

The macro assembler generates linkable and relocatable code, provides expanded macro capability and can produce a cross-reference listing, the firm said.

It also contains a text editor with string search, substitution, insertion and deletion commands and provides access to the system monitor.

The compiler is priced at $975 and deliveries begin in November, Intel said from 3065 Bowers Ave., Santa Clara, Calif. 95051.

Single-Board 80/20 From Intel Has Multiprocessor Capability

SANTA CLARA, Calif. – Intel Corp.'s SBC 80/20 single-board computer contains full multiprocessor capability, programmable interval times and programmable interrupt control on a 6.75- by 12-in. board, according to the vendor.

The unit can operate as a stand-alone, 8-bit general-purpose computer, as part of a distributed processing network or in a multiprocessor system containing up to 16 SBC 80/20s or other master subsystems, Intel said.

In contrast with its predecessor, the 80/10, the 80/20 enhancements include a reduction in CPU real-time loading made possible through LSI peripherals that increase throughput and real-time responses, the firm sald.

These peripherals allow system operating configurations to be customized with software.

The system includes an 8080A 8-bit parallel NMOS CPU; 2K bytes of read/write memory in static random access memories (RAM); sockets for up to 4K bytes of erasable, reprogrammable or masked read-only memory; and 48 programmable parallel I/O lines with sockets.

Microcosm

It also includes a programmable serial data I/O interface and software-selectable bit/sec rate generation along with RS-232C capability; a master bus control logic for four masters, extendable to 16; an eight-level programmable interrupt control; and bus expansion drivers.

Since each 80/20 contains its own local memory and I/O, several may simultaneously execute programs without incurring speed reductions from heavy bus loading, the firm said. Interprocessor communication occurs via global memory and the system bus.

Various memories and diskette peripherals as well as card-cage modules are available.

System programming, the only development task associated with using the SBC 80/20, can be done directly using the Intellec microcomputer development system, Intel's ICE-80 in-circuit emulator and resident software, the firm said.

Single-unit cost of the 80/20 is $895; the price for quantities of 100 is $520. OEM discounts apply to quantities over 10 units, the firm said from 3065 Bowers Ave., Santa Clara, Calif. 95051.

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ISI Organizers Find Starting Software House Trying

By John Stephenson

Special to Computerworld

DURHAM, N.H. – Starting a software house and building it into a successful, if small, venture can be a trying experience.

Seven years after its founders took their first trial steps in the industry, business is looking up for Instructional Services, Inc. (ISI), an educational consulting group here.

The company has adapted minicomputers to handle educational management software and has a growing share of this market, according to Tim Cook, vice-president of marketing. "We're looking at projected sales of $220,000 this year," he noted.

Formed by Teachers

ISI's six founders all taught in the math department at the same high school. They noticed school administrators had trouble handling information – grade reporting, student schedules, program budgets and so on.

"We used to say, 'There has to be a better way,'" Cook recalled. "We knew we could do it better."

So, the six formed ISI in the fall of 1969. Dan Heisey, president and majority owner of the company, financed the venture on assets of less than $100,000.

Heisey renewed old contacts, and ISI went to work helping schools which had received government grants to develop innovative programs.

The company introduced teachers to new programs, supervised the programs and handled the complicated reporting required by the government.

ISI also worked on solutions to the information-handling problems the teachers had seen in schools. "At first we did a lot of this by hand," Cook said, "but gradually it became clear we had to go to computers."

Heisey, who had moonlighted as a programmer for several years, decided to try to program school management systems on a minicomputer. "I thought if we can get these machines to do that kind of work, the low overhead would really give us a financial edge," Heisey explained. ISI leased a Digital Equipment Corp. PDP-12, and Heisey went to work.

'Too Many Pressures'

One by one, four of the original founders sold their shares and dropped out. "There were too many pressures," Cook explained.

"We all put in tremendous hours. When something had to be done, and we couldn't pay someone else to do it, one of us had to come in. I remember once I worked 56 hours straight. Then I came in two days later and worked two 36-hour shifts," he said.

"For a while, we had tremendous problems with cash flow," he added. "Schools use a fiscal year that starts in July, so we'd get lots of money in the first part of August, then have to stretch it over the whole year."

In 1972, Steve Blain joined ISI and began straightening out the company's finances. "Before that, nobody was really doing it," Cook said. "One year, we made $12,000. The next year, without knowing it, we spent that, plus another $8,000. We were in the hole, and we didn't even know it."

Scheduling System

Heisey knew that scheduling was one of the toughest information-handling problems for schools. Someone must juggle student course requests, available courses and time and room openings to organize a master schedule, so Heisey developed the Omega scheduling system and wrote a program allowing it to be run on ISI's mini.

ISI also used the mini to analyze student learning patterns and organize program budgeting and other management information systems for schools.

Heisey gave a number of reasons for ISI's growth over the next few years. The company learned how to "persuade" a mini to do the work of far more expensive machines. The low overhead simplified financial problems and gave ISI a big edge over larger competitors.

Seven years after the company was formed, ISI's outlook is bright. The company serves 80 school districts and has bought a DEC PDP-8 to help handle the workload.

ISI now offers a wide range of DP services for schools, including attendance, grade reporting, scheduling, budget accounting and payroll.

The company does management consulting for schools with special problems and helps develop instructional programs.

Executive Corner

- Robert W. Roth has been appointed vice-president and sales manager for Western Union Data Services Co.
- Alexander W. Giles Jr. has been named vice-president of finance and administration for Modular Computer Systems, Inc.
- Murray Friedberg has been appointed senior vice-president of operations for Applied Systematics, Inc.
- Seymour A. Rosen has been named vice-president and general manager of General Instrument Corp.'s Business Systems Division.
- David S. Leff has been appointed director of procurement and Joseph M. Mulroy has been named director of contracts for Burroughs Corp.'s Federal and Special Systems Group.
- Thomas A. D'Auria has been appointed vice-president, marketing and administration, of Sysdoc, Inc. He was previously manager of user services for the Columbia University computer center.
- Edward J. Gunnigle has been appointed to the board of directors of Applied Digital Data Systems, Inc.
- James W. McNabb has been named vice-president of operations at General Datacomm Industries, Inc.
- Dr. P.J. Plauger has been appointed vice-president of technical services and Christopher Gane has been named vice-president of marketing at Yourdon, Inc.
- George A. Reed has resigned as a director and vice-president of finance at Data 100 Corp. He will continue to be employed by the company as a financial consultant.
- Paul B. Wesling has been appointed vice-president of product integrity at Data Disc, Inc.

Configure a winner.

A special report on *Data Communications Network Configurations* in the November 29th *Computerworld*.

Configuring a new data communications network could be one of the most demanding challenges you face in a decade. It means your DP staff -- including managers and technical specialists -- must make crucial choices on many costly items like terminals, modems, line speeds and protocols. In addition, numerous intangibles are changing the data communications environment, and your contingency preparations should encompass these. Building greater flexibility into your system to accept new sites, faster lines, more advanced equipment, etc. is one example. In sum, a data comm network means a long term capital investment for your organization. And this requires long range planning for a system that will meet your teleprocessing needs today -- and in the future.

Computerworld's November 29th issue will include a special report, edited by Ron Frank, on *Data Communications Network Configurations*. The supplement can show you some of the right ways to plan your network -- and how to avoid common pitfalls. In addition to case studies and commentary from well-informed users who understand the data communications environment with all its implications, you'll find applications stories and tutorials on the equipment, carrier services, line protocols, teleprocessing software, etc. that's available to make up your system.

So whether you're building a network or managing one, you'll find important and useful information in the November 29th *Computerworld*. And if you're marketing data communications products or services, you should advertise to your audience here. The ad closing date is November 12th. Talk to your *Computerworld* salesman for complete details. Or call Judy Milford at (617) 965-5800.

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Earnings Reports

AMERICAN MICROSYSTEMS
Three Months Ended July 3

	1976	1975
Shr Ernd	.....	$.10
Revenue	$17,341,000	16,157,000
Earnings	(5,298,000)	223,000
6 Mo Shr	.....	.19
Revenue	32,035,000	31,359,000
Earnings	(9,149,000)	415,000

APPLIED MAGNETICS
Three Months Ended June 30

	1976	1975
Shr Ernd	$.10	$.06
Revenue	16,054,000	14,992,000
Earnings	421,000	240,000
9 Mo Shr	.20	.12
Revenue	45,629,000	46,935,000
Earnings	842,000	502,000

BEEHIVE MEDICAL ELECTRONICS
Three Months Ended June 30

	1976	1975
Shr Ernd	$.20	$.11
Revenue	3,237,627	2,522,256
Earnings	187,836	104,922
9 Mo Shr	.57	.34
Revenue	8,730,514	6,804,366
Earnings	538,043	318,026

BOOTHE COMPUTER
Three Months Ended June 30

	1976	1975
Shr Ernd	$.28	$1.01
Revenue	14,543,000	10,114,000
Disc Op	.....	(56,000)
Spec Cred	.....	a3,775,000
Earnings	1,053,000	3,942,000
6 Mo Shr	.46	1.03
Revenue	26,612,000	19,703,000
Disc Op	.....	55,000
Spec Cred	.....	a3,775,000
Earnings	1,750,000	4,001,000

a-From extinguishment of debt.

BUNKER RAMO
Three Months Ended June 30

	1976	a1975
Shr Ernd	$.29	$.03
Revenue	81,271,000	76,444,000
Tax Cred	835,000	.....
Earnings	2,287,000	848,000
6 Mo Shr	.31	b.....
Revenue	164,564,000	148,189,000
Tax Cred	1,350,000	.....
Earnings	3,094,000	465,000

a-Restated for foreign currency translation. b-Preferred dividend requirements exceeded net income.

BURROUGHS
Three Months Ended June 30

	1976 (000)	a1975 (000)
Shr Ernd	$1.05	$.99
Revenue	464,300	416,890
Earnings	42,470	39,137
6 Mo Shr	1.66	1.58
Revenue	869,573	782,103
Earnings	66,740	62,508

a-Restated.

CINCINNATI MILACRON
Three Months Ended June 30

	1976 (000)	a1975 (000)
Shr Ernd	$.52	$.90
Revenue	107,280	107,625
Earnings	1,940	3,317
6 Mo Shr	.93	1.69
Revenue	213,453	216,904
Earnings	3,480	6,228

a-Restated.

CODEX
Three Months Ended June 30

	1976	1975
Shr Ernd	$.59	$.76
Revenue	7,303,000	6,711,000
Earnings	941,000	1,172,000
9 Mo Shr	1.38	2.22
Revenue	18,917,000	19,040,000
Earnings	2,174,000	3,355,000

COMMUNICATIONS SATELLITE
Three Months Ended June 30

	1976	1975
Shr Ernd	$1.08	$1.16
Revenue	39,456,000	34,590,000
Earnings	10,849,000	11,628,000
6 Mo Shr	2.19	2.43
Revenue	76,732,000	71,065,000
Earnings	21,890,000	24,320,000

COMPUTER SCIENCES
Three Months Ended July 2

	1976	1975
Shr Ernd	$.23	$.11
Revenue	55,541,000	50,367,000
Tax Cred	750,000	.....
Earnings	3,288,000	1,542,000

DECISION DATA COMPUTER
Three Months Ended Feb. 28

	1976	1975
Shr Ernd	.....	$.11
Revenue	$7,728,000	11,690,000
Tax Cred	.....	162,000
Earnings	(621,000)	425,000

HAZELTINE
Three Months Ended June 30

	1976	1975
Shr Ernd	$2.05	.....
Revenue	23,848,000	$21,082,000
Tax Cred	770,000	.....
Earnings	4,125,000	(325,000)
6 Mo Shr	2.45	.....
Revenue	44,772,000	37,875,000
Tax Cred	1,050,000	.....
Earnings	4,905,000	(1,365,000)

CONRAC
Three Months Ended June 30

	1976	a1975
bShr Ernd	$.89	$.59
Revenue	34,509,000	21,954,000
Earnings	1,462,000	889,000
b6 Mo Shr	1.64	1.10
Revenue	62,135,000	42,963,000
Earnings	2,607,000	1,642,000

a-Restated. b-Reflects 10% stock dividend in July 1976.

DATA DOCUMENTS
Three Months Ended June 30

	1976	1975
Shr Ernd	$1.01	$1.27
Revenue	17,121,276	16,424,815
Earnings	473,946	698,298
9 Mo Shr	4.32	4.72
Revenue	53,596,032	47,984,325
Tax Cred	.....	5,000
Earnings	2,027,650	2,219,454

DATAPRODUCTS
Three Months Ended June 26

	1978	1975
Shr Ernd	$.48	$.25
Revenue	26,700,000	18,693,000
Earnings	a3,575,000	b1,731,000

a-Includes $1,118,000 from sale of building. b-Includes $739,000 from sale of Data Card Corp. shares.

DATUM
Three Months Ended June 30

	1976	1975
Shr Ernd	.....	$.01
Revenue	$3,202,000	3,121,000
Earnings	a(479,000)	21,000
6 Mo Shr	.....	.....
Revenue	6,742,000	6,288,000
Loss	a432,000	37,000

a-Includes $1,044,000 inventory write-down and contract overrun reserve.

DOCUTEL
Three Months Ended June 30

	1976	1975
Shr Ernd	$.26	$.06
Revenue	8,422,000	6,453,000
Tax Cred	343,000	65,000
Earnings	686,000	145,000
6 Mo Shr	.50	.08
Revenue	16,670,000	12,265,000
Tax Cred	644,000	94,000
Earnings	1,300,000	208,000

ELECTRONIC ASSOCIATES
Three Months Ended July 2

	1976	a1975
Shr Ernd	$.22	$.10
bRevenue	6,247,000	7,511,000
Disc Op	544,000	.....
Tax Cred	254,000	92,000
Earnings	582,000	258,000
6 Mo Shr	.....	.25
bRevenue	11,751,000	15,250,000
Disc Op	544,000	.....
Tax Cred	264,000	301,000
Earnings	(352,000)	661,000

a-Restated. b-From continuing operations.

ELECTRONIC MEMORIES & MAGNETICS
Three Months Ended June 30

	1976	1975
Shr Ernd	$.20	.....
Revenue	22,372,000	$25,236,000
Earnings	1,321,000	134,000
6 Mo Shr	.92	.....
Revenue	43,214,000	48,898,000
Earnings	a5,481,000	(260,000)

a-Includes gain on sale of $3,789,000 investment.

FOUR-PHASE SYSTEMS
Three Months Ended June 30

	1976	1975
Shr Ernd	$.61	$.28
Revenue	15,037,359	12,366,633
Tax Cred	717,000	187,000
Earnings	1,728,705	526,319
6 Mo Shr	1.28	.48
Revenue	29,727,234	23,664,795
Tax Cred	1,336,000	298,000
Earnings	3,244,563	797,941

INFORMATION MAGNETICS
Three Months Ended July 3

	1976	1975
Shr Ernd	$.32	$.45
Revenue	8,340,000	5,946,000
Tax Cred	18,000	266,000
Earnings	473,000	569,000
6 Mo Shr	.68	.85
Revenue	16,510,000	11,570,000
Tax Cred	48,000	609,000
Earnings	936,000	1,075,000

ITEK
Three Months Ended July 2

	1976 (000)	1975 (000)
Shr Ernd	$.24	$.05
Revenue	50,708	50,873
Earnings	744	155
6 Mo Shr	.36	.....
Revenue	104,063	95,980
Earnings	1,126	(469)

INFOREX
Three Months Ended July 2

	1976	a1975
Shr Ernd	$.17	$.07
Revenue	15,476,000	14,582,000
Tax Cred	228,000	.....
Earnings	499,000	192,000
6 Mo Shr	.29	.09
Revenue	30,383,000	27,728,000
Tax Cred	369,000	58,000
Earnings	852,000	271,000

a-Restated.

Wema Urges Updating of Tariff Law

PALO ALTO, Calif. – An "outmoded, poorly written" customs law is causing U.S. businessmen to be treated like criminals, according to the Western Electronics Manufacturers Association (Wema).

The Tariff Law of 1930, which Wema said was written for "an era of prohibition and rum-running," is hopelessly out-of-date when applied to electronics companies such as semiconductor firms which regularly ship U.S.-made components overseas to be assembled into products for reshipment to the U.S., a Wema spokesman said recently.

In testimony before the Subcommittee on Trade of the House Ways and Means Committee, Robert Noyce, chairman of the board of Intel Corp., recommended on Wema's behalf that Congress modernize Section 592 of the 1930 law to rectify the "unfairness" of its applications to a whole range of violations, ranging from inadvertent error to deliberate fraud.

Wema recommended that the Congress amend Section 592 to:

- Permit an importer to voluntarily come forward and make restitution for underpaid duties without exposing himself to the normal penalty actions.
- Eliminate penalty notices demanding forfeiture of imported goods when the forfeiture demanded bears little or no relationship to the alleged offense or to the actual amount of revenue lost by the government.
- Provide a meaningful and unrestricted judicial review for those cases where the importer wants to appeal the Customs penalty, which he cannot do under the present law without risking litigation on the full domestic value of the goods.

Make clear distinction between fraudulent and negligent acts. Provide no penalties for clerical errors, mistakes of fact or law, inadvertence or trivial negligent acts.

Noyce pointed out that the law hits particularly hard at semiconductor and other high-technology manufacturers with final assembly operations overseas.

Complex semiconductor circuits are precision-made in the U.S. and shipped overseas for hand assembly into finished products, he explained. This assembly operation represents only a small fraction of the total value of the finished product, and only that small "value added" is subject to customs duty.

Yet, because of the inflexibilities of Section 592, if a question arises about the importation, a penalty notice is issued against the importer for the total dollar value of the shipment, he said. This results in announcements of multimillion-dollar claims against an importer when the actual revenue loss to the government is only a fraction of that amount, he noted.

The 1930 statute requires this kind of notice regardless of the actual customer revenue at stake or the degree of culpability involved in the misclassification or erroneous valuation of the goods imported, Noyce stated.

The law's language is so rigid the same penalties are issued in cases involving inadvertent oversight as in cases of willful violations of the law, he added.

Service Reconditions Tape Heads, Cites User Savings in Purchases

MISSION HILLS, Calif. — Magnetic Recovery Technologists, Inc. (MRT), which provides tape-head reconditioning for both end users and manufacturers, has enabled one large customer to reduce purchases of new heads by 40%, according to Bob Sillers, vice-president of sales.

A dual-gap 1,600 bit/in. industry-compatible head costs about $325, but MRT will recondition these heads for $85 in quantities of 50 or more or for $125 in small quantities, he said.

Founders of the firm, who had all worked for head manufacturers, noticed heads being returned for reconditioning received low priority and took three months to a year to service. Thus, the user was left with no choice but to buy a new head, he said.

MRT generally reconditions and returns lots in two weeks, he noted, adding acceptance of the firm's reconditioning service has been "overwhelming."

Most of MRT's customers are manufacturers.

MRT does not yet recondition disk heads, but Sillers said it plans to offer this service in the future.

The two-year-old firm doubled its business in the last year and anticipates growing 50% to 75% next year, he said.

MRT is at 10145 Sepulveda Blvd., Mission Hills, Calif. 91345.

Supershorts

The race is heating up for the first introduction of a 6,250 bit/in. tape drive suitable for minis and midis, according to sources. A logical vendor would be Storage Technology Corp., one of the first to announce a large-scale 6,250 bit/in. drive, the sources noted.

– – –

The Japan branch of ICC Far East, Inc., a subsidiary of International Communications Corp., has been granted expanded operating status by the Japanese Ministry of International Trade and Industry. ICC Far East is now authorized to provide complete sales, leasing, rental and service of data communications equipment.

– – –

Inforex, Inc. has named Oriental Computer Engineering Corp. as its marketing distributor in South Korea.

– – –

Dataproducts Corp. has made its first Model 2230 printer shipments from its Dublin, Ireland, plant. Production capacity is expected to grow to 25 unit/week by the end of 1977.

– – –

Shugart Associates has approved flexible disks manufactured by Information Terminals Corp. for use in Shugart flexible diskette drives.

– – –

Applied Digital Data Systems, Inc. has shipped its 25,000th video display terminal. The Consul 980 was part of a shipment to Honeywell of Phoenix.

Correction

The company referred to as Broadway Associates in "Service Industry to Pass $9 Billion Mark by 1980" [CW, Sept. 13] is Broadview Associates.

Trans-Data Seeking Used Disk Heads

BELMONT, Calif. – Trans-Data Corp. is actively seeking sources of crashed or used IBM 2314- or 3330-compatible disk heads for its expanding replacement head business.

Trans-Data repairs and refurbishes disk heads and disk-drive spindle assemblies for third-party maintenance companies, OEM manufacturers and end users.

Finished products are guaranteed to meet or exceed OEM specifications; the actual performance data for each unit is included from test stand runs before shipment, the firm said.

The company services heads from IBM, California Computer Products, Memorex, Ampex, Diablo and Tracor, it added.

Trans-Data is at 170 Glenn Way, Belmont, Calif. 94002.

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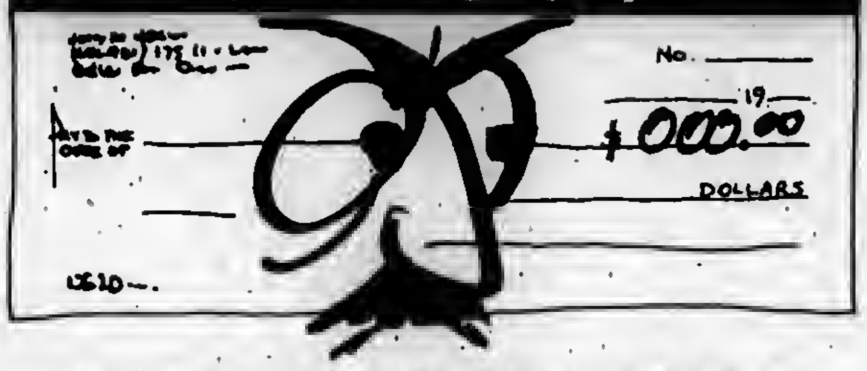

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Holders Win Ampex Suit

SAN FRANCISCO – A federal judge here has awarded a $9 million settlement to purchasers of Ampex Corp. securities from May 1970 through August 1972.

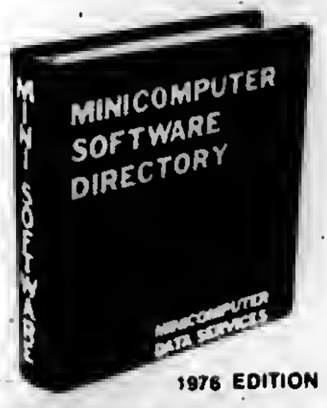
The purchasers of securities had named as defendants Ampex, certain present and former Ampex directors and officers and the firm's former auditor, Touche Ross & Co.

Filed in January 1972, the suit charged purchasers were damaged because the defendants issued false and misleading information in annual interim reports, news releases and filings with the Securities and Exchange Commission.

Overstatements Alleged

The suit alleged the defendants overstated accounts and notes receivable, failed to establish reserves for doubtful accounts, failed to write off certain assets and failed to report proposed discontinuation of certain product lines.

The $9 million settlement fund is made up of $2.3 million from Ampex, $5.5 million from Lloyd's of London as insurer of the directors and $1.3 million from Touche Ross.



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Lear Siegler Posts Net With 32% Rise for Year

SANTA MONICA, Calif. – Lear Siegler, Inc. finished the year with its strongest quarter of the year. Revenues for the year were up 8% over the previous year's figures and earnings rose 32%.

Earnings for the fourth quarter were $9.9 million or 59 cents a share compared with $6.9 million or 41 cents in the same quarter last year.

Quarter revenues climbed to $912.3 million from $170.4 million in the year-ago period.

Earnings for the year were $25.4 million or $1.75 a share compared with $19.3 million or $1.24 a share a year ago.

Revenues were $694.3 million compared with $642.5 million a year ago.

Sales of Lear Siegler's terminals were $13.7 million, up 80% from $7.5 million in fiscal 1975.

During the year, the company acquired the remaining 50% interest in American Aviation and the remaining 10% interest in Acts Computing Corp. as well as the Sierra Electronic Operation of Aeronutronic Ford.

Since June 30, 1973, Lear Siegler has disposed of seven divisions or subdivisions which generated nearly $50 million of sales in 1973, according to Robert T. Campion, chairman.

DDI Half-Year Net Dips

GREENWICH, Conn. – Data Dimensions, Inc. (DDI) saw its earnings risa in the second quarter but decline in the six months.

Earnings for the quarter ended June 30 rose to $111,000 or 14 cents a share, including a $75,000 tax credit, compared with $100,000 or 13 cents a share with a $45,000 tax credit in the year-ago period.

Revenues rose to $2.1 million from $1.2 million in the 1975 quarter.

In the six months, earnings dropped to $220,000 or 28 cents a share compared with $229,000 or 29 cents a share, including a $50,000 tax credit, in the year-ago period.

Half-year revenues rose to $3.8 million compared with $2.3 million in the same period last year.

Lester M. Gottlieb, president, said the increase in second-quarter revenues was brought by a high percentage of outright sale of equipment.

The company is in the process of renegotiating its line of credit and modifying marketing and pricing plans to increase the equipment rental base, he added.

Quantor Reports Earnings Up 31% As Revenues Climb 27% in Year

MOUNTAIN VIEW, Calif. – Quantor Corp.'s 1976 earnings rose 31% while revenues gained 27% over the preceding year.

Earnings for the fourth quarter rose to $336,000 or 12 cents a share, including a $164,000 tax credit, compared with $245,000 or 9 cents a share with a $115,000 tax credit in the year-ago period.

Revenues climbed to $4.9 million compared with $3.7 million in the 1975 fourth quarter.

For the year ended July 31, Quantor reported earnings of $940,206 or 34 cents a share, including a tax credit of $440,000. Last year's earnings totaled $715,524 or 26 cents a share, including a $335,000 tax credit.

Revenues for the year rose to $16.8 million compared with $13.2 million in 1975.

"The performance improvement in revenue and earnings was accomplished although performance in first fiscal half had leveled off due to the recession," Charles Askanas, president, said.

"The second half showed the renewed growth and considerable improvement in margins we predicted in September of 1975.

"As for the future, the economy is improving and the computer output microfilm market is continuing to grow at a compounded rate of 30% per year."

Revenues Jump 50% In Telefile Period

IRVINE, Calif. – Telefile Computer Corp.'s nine-month revenues rose 50% over the year-ago figure due in large part to a 152% Increase in the third quarter which helped offset the prior six months' loss.

Earnings for the third quarter were $530,831, including a $148,000 tax credit. This compared with a third-quarter loss of $6,592 in 1975.

Quarter earnings offset the prior six months' loss of $198,781 and resulted in accumulated nine-month earnings of $332,050 or 28 cents a share.

Third-quarter revenues were $2.2 million compared with $860,404 in the year-ago period.

Revenues for the nine months were $3.6 million compared with $2.3 million in the 1975 nine months.

Nickels & Dimes

Pertec Corp. has changed its name to Pertec Computer Corp. and its state of incorporation from California to Delaware. The firm will also issue 300,000 shares for its Employee Stock Purchase Plan.

$ $ $

Wang Laboratories has increased its quarterly dividend to 3 cents a share for common stock and 5 cents for Class B common, payable Oct. 28 to holders of record Sept. 20.

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Electronic Memorles & Magnetics declared a dividend of 25 cents a share payable Sept. 10 to holders of record Aug. 25.

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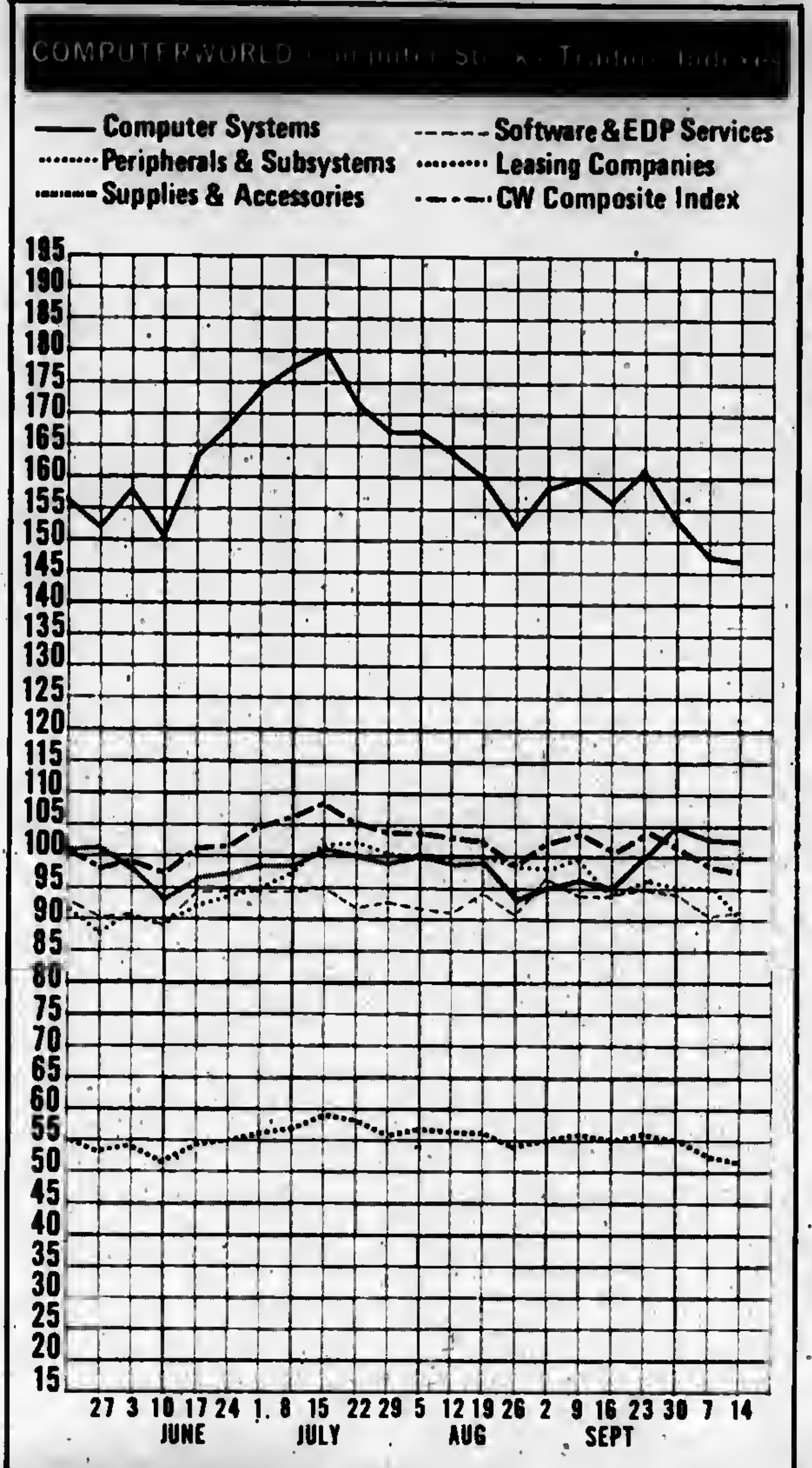

Earnings Reports

BOLT BERANEK & NEWMAN
Year Ended June 30

	1976	1975
Shr Ernd	.....	b$1.03
Revenue	$27,892,100	28,688,200
Earnings	(281,300)	b1,271,100
3 Mo Shr	.11	.14
Revenue	7,201,400	8,049,500
aEarnings	134,000	176,300

a-Includes $1.2 million gain on long-term investment disposition in the year and $704,100 in the 1976 quarter compared with $39,500 in the 1975 year and quarter. Also includes development and start-up costs related to Telenet Communications Corp. of $1.4 million in the year and $393,900 in the 1976 quarter compared with $471,300 and $196,400 in 1975, respectively. b-Includes $308,300 gain from exchange of non-exclusive license.

CARTERFONE COMMUNICATIONS
Three Months Ended June 30

	1976	1975
Shr Ernd	$.07	$.08
Revenue	2,408,300	1,836,300
Spec Cred	.....	e7,900
Earnings	142,100	164,600
9 Mo Shr	.31	.23
Revenue	6,925,300	5,383,900
Spec Cred	......	e15,700
Earnings	652,100	449,600

e-From fully reserved nontrade note receivable collection.

CENTRONICS DATA COMPUTER
Year Ended June 30

	1976	1975
Shr Ernd	$2.02	$1.52
Revenue	52,182,233	41,535,529
Earnings	9,763,897	7,281,018

HEWLETT-PACKARD
Three Months Ended July 31

	1976	1975
Shr Ernd	$.65	$.73
Revenue	277,477,000	245,880,000
Earnings	18,472,000	20,286,000
9 Mo Shr	2.05	2.27
Revenue	792,880,000	706,256,000
Earnings	57,319,000	62,651,000

MCI COMMUNICATIONS
Year Ended March 31

	1976	1975
Revenue	$28,430,000	$6,845,000
Loss	27,790,000	39,289,000

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, OCTOBER 13, 1976

All statistics compiled, computed and formatted by
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Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		PRICE 1976 RANGE 111	CLOSE OCT 13 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	84-108	88	- 1/4	-0.2
O	COMPUTER AUTOMATION	10- 19	14 3/4	- 1/4	-1.6
N	CONTROL DATA CORP	18- 27	23 1/4	0	0.0
N	DATA GENERAL CORP	40- 60	44 1/8	-1	-2.2
O	DATAPOINT CORP	24- 46	28 3/4	0	0.0
O	DIGITAL COMP CONTROL	2- 7	6	+ 1/8	+2.1
N	DIGITAL EQUIPMENT	138-181	131 1/2	-1 3/4	-1.1
N	ELECTRONIC ASSOC.	2- 3	2 3/8	- 1/8	-4.5
A	ELECTRONIC ENGINEER.	7- 16	8 5/8	+ 1/4	+2.9
N	FOXBORO	28- 30	43	- 3/4	-1.6
O	GENERAL AUTOMATION	4- 11	4 3/8	0	0.0
O	GRI COMPUTER CORP	1- 1	3/8	0	0.0
N	HEWLETT-PACKARD CO	83-117	86 3/4	-2 5/4	-3.0
N	HONEYWELL INC	34- 36	42 3/8	-1 3/4	-3.9
N	IBM	227-288	272 1/2	-7	-2.3
O	MANAGEMENT ASSIST	1- 5	1 3/4	+ 3/8	+27.2
O	MEMOREK	18- 33	22	0	0.0
O	MICRODATA CORP	10- 28	21 5/8	-1	-4.4
O	MODULAR COMPUTER SYS	4- 14	5 3/4	- 1/2	-11.7
N	NCR	24- 37	54 3/4	+ 5/8	+1.0
O	PRIME COMPUTER INC	4- 14	12 3/4	+ 1/4	+2.0
N	PERKIN-ELMER	19- 27	22 1/8	+ 3/8	+2.9
N	RAYTHEON CO	43- 67	63 3/8	+ 7/8	+1.5
N	SPERRY RAND	40- 32	43 1/4	-2	-4.2
O	SYCOR INC	12- 31	12 1/2	+ 1/2	+4.1
A	SYSTEMS ENG. LABS	6- 10	6 3/8	- 3/4	-10.1
N	VARIAN ASSOCIATES	15- 17	12 3/4	- 3/4	-3.5
A	WANG LABS.	11- 20	13 7/8	- 3/4	-5.1

LEASING COMPANIES

EXCH		PRICE 1976 RANGE 111	CLOSE OCT 13 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMDISCO INC	3- 10	9 1/2	+ 3/4	+8.5
A	COMMERCE GROUP CORP	2- 3	2	0	0.0
A	COMPUTER INVSTRS GRP	1- 5	1 7/8	+ 1/4	+15.5
N	DATRONIC RENTAL	1- 8	7/8	+ 1/8	+16.6
A	DCL INC	1- 1	3/8	0	0.0
N	DRF INC	3- 8	6 7/8	- 1/4	-3.5
N	ITEL	6- 13	11 5/4	-1 1/4	-9.6
N	LEASCO CORP	6- 19	16	+ 1/8	+0.7
O	LEASPAC CORP	0- 1	1/8	- 1/8	-30.0
O	NRG INC	0- 1	1/4	-	-16.5
A	PIONEER TEX CORP	6- 9	7 1/4	- 1/8	-1.6
N	U.S. LEASING	7- 12	8 5/4	- 1/4	-2.7

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SOFTWARE & EDP SERVICES

EXCH		PRICE 1976 RANGE 111	CLOSE OCT 13 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 3	1 1/2	+ 1/8	+9.0
O	ANACOMP INC	6- 11	7 1/8	0	0.0
A	APPLIED DATA RES.	2- 4	3 1/8	+ 1/8	+4.1
N	AUTOMATIC DATA PROC	17- 33	27	-2	-6.8
O	COLEMAN AMERICAN COS	2- 6	2 1/8	+ 1/4	+13.3
O	COMPUTER DIMENSIONS	3- 7	3 1/2	- 1/2	-8.3
O	COMP ELECTION SYSTMS	3- 9	3 3/4	+ 1/2	+9.3
O	COMPUTER HORIZONS	1- 2	1 1/2	0	0.0
O	COMPUTER NETWORK	2- 6	3 3/4	+ 3/8	+6.9
N	COMPUTER SCIENCES	4- 8	3 3/8	- 1/2	-8.1
O	COMPUTER TASK GROUP	1- 1	1 3/8	+ 1/8	+8.3
O	COMPUTER USAGE	3- 6	3	0	0.0
O	COMSHARE	2- 9	4 3/4	0	0.0
O	DATA DIMENSIONS INC	2- 4	2 3/4	- 1/8	-4.3
O	DATATAB	1- 1	1 3/8	0	0.0
N	ELECTRONIC DATA SYS.	12- 18	13 3/8	0	0.0
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	INSYTE CORP	1- 3	1 1/2	0	0.0
O	IPS COMPUTER MARKET.	1- 2	1 1/4	+ 1/8	+11.1
O	KEANE ASSOCIATES	2- 4	2 1/4	+ 1/8	+5.8
O	KEYDATA CORP	2- 3	1 3/8	+ 1/8	+8.5
O	LOGICON	3- 4	3 5/8	0	0.0
A	MANAGEMENT DATA	1- 3	2 1/4	0	0.0
A	NATIONAL CSS INC	13- 23	19 5/8	+ 1/2	+2.6
A	ON LINE SYSTEMS INC	18- 22	18 1/8	- 1/4	-1.3
N	PLANNING RESEARCH	3- 3	3 3/8	- 3/8	-10.0
O	PROGRAMMING & SYS	1- 1	3/8	0	0.0
O	RAPIDATA INC	2- 3	1 3/8	0	0.0
O	REYNOLDS & REYNOLD	13- 21	15 5/4	+ 1/2	+3.2
O	SCIENTIFIC COMPUTERS	1- 1	7/8	0	0.0
O	TYMSHARE INC	13- 28	13 1/4	+ 3/4	+5.1
A	UPS SYSTEMS	3- 3	3 5/8	- 1/8	5.5
N	WYLY CORP	2- 7	1 1/2	0	0.0

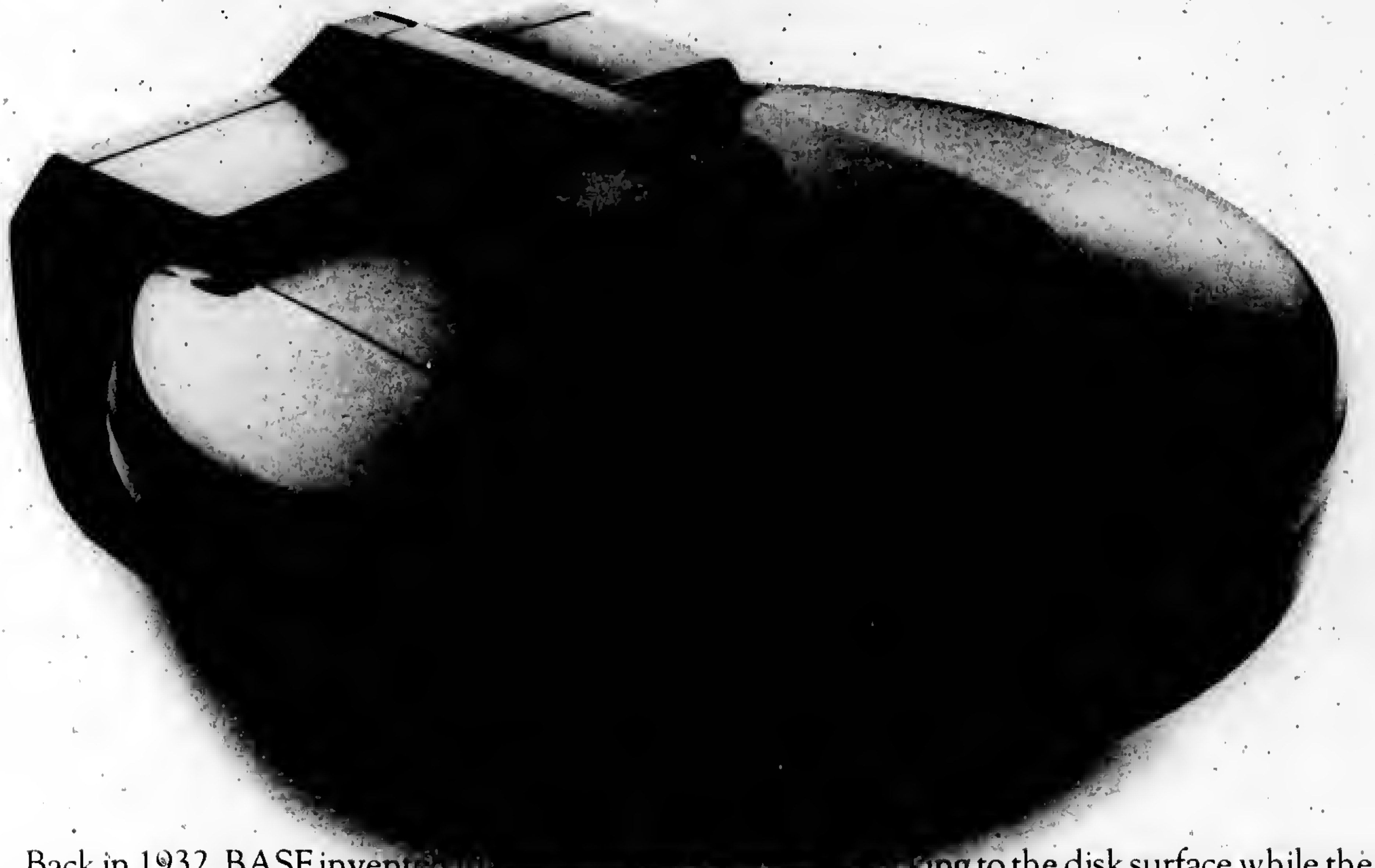
PERIPHERALS & SUBSYSTEMS

EXCH		PRICE 1976 RANGE 111	CLOSE OCT 13 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	8- 13	9 7/8	- 5/4	-7.0
O	ADVANCED MEMORY SYS	4- 10	6 1/4	0	0.0
N	AMPEX CORP	3- 10	6	- 3/8	-3.8
O	ANDERSON JACOBSON	2- 4	2 7/8	0	0.0
O	APPLIED DIG DATA SYS	13- 23	18 1/4	- 1/4	-1.3
O	BEEHIVE MEDICAL ELEC	3- 9	8 3/8	- 3/8	-6.9
A	BOLT, BERANEK & NEW	7- 11	7 3/8	- 3/8	-4.6
N	BUNKER-RAMO	3- 10	6 1/2	- 5/8	-8.7
A	CALCOMP	4- 7	5 7/8	- 1/4	-6.0
O	CAMBRIDGE MEMORIES	0- 6	3/8	+ 1/8	+50.0
N	CENTRONICS DATA COMP	20- 36	30 5/4	-2 1/8	-6.4
O	COOEK CORP	22- 42	28 1/2	0	0.0
O	COGNITRONICS	1- 1	3/4	0	0.0
O	COMPUTER COMMUN.	1- 6	5 3/8	- 1/4	-4.4
O	COMPUTER CONSOLES	4- 7	4 1/2	0	0.0
A	COMPUTER EQUIPMENT	1- 5	1 5/4	0	0.0
O	COMPUTER TRANSCEIVER	1- 3	1	0	0.0
O	COMTEN	4- 9	7 1/4	0	0.0
N	CONRAC CORP	20- 25	20 7/8	- 1/8	-0.5
O	DATA ACCESS SYSTEMS	1- 4	4 3/4	0	0.0
O	DATA 100	7- 13	8 1/4	+ 1/8	+1.3
A	DATA PRODUCTS CORP	3- 13	10 7/8	- 1/2	-4.5
O	DATA TECHNOLOGY	1- 2	1 1/4	- 1/8	-9.0
O	DATUM INC	1- 2	1	- 1/8	-11.1
O	DECISION DATA COMPUT	1- 4	1 3/8	+ 1/8	+8.3
O	DELTA DATA SYSTEMS	1- 1	3/8	- 1/8	-16.6
N	ELECTRONIC M & M	1- 4	3 1/4	0	0.0
O	FABRI-TEK	1- 1	3/4	+ 1/8	+20.0
O	GENERAL COMPUTER SYS	1- 2	3/8	- 1/4	-28.3
N	HAZELTINE CORP	4- 12	8 1/4	+ 1/8	+1.3
N	HARRIS CORP	34- 53	49	-2	-3.9
A	INCOTERM CORP	9- 20	12 3/8	- 1/2	-3.8
O	INFOREX INC	3- 7	4 1/8	- 3/8	-8.3
O	INFORMATION INTL INC	10- 18	11 1/2	- 1/8	-1.0
O	INTEL CORP	54-109	37 1/2	+3 1/2	+6.4
A	LUNDY ELECTRONICS	3- 7	3 3/8	- 1/8	-3.5
O	MSI DATA CORP	3- 7	3 7/8	+ 1/2	+9.3
A	MILGO ELECTRONICS	13- 21	15 7/8	- 3/4	-4.5
N	MOHAWK DATA SCI	3- 10	3 3/8	-1 1/8	-16.6
O	PENRIL CORP	1- 3	2	0	0.0
A	PERTEC CORP	3- 8	6 1/8	+ 1/8	+2.0
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	5- 10	3	0	0.0
O	QUANTOR CORP	4- 6	4	- 1/8	-3.0
O	RECOGNITION EQUIP	6- 11	8	- 1/2	-5.8
N	SANDERS ASSOCIATES	6- 11	8 3/8	- 1/8	-1.4
O	SCAN DATA	2- 4	1 1/2	-	-5.8
O	STORAGE TECHNOLOGY	9- 13	10	- 1/4	-2.4
O	T BAR INC	3- 10	3 3/4	0	0.0
O	TALLY CORP.	4- 6	4	0	0.0
O	TEC INC	3- 7	6 1/2	+ 1/4	+4.0
N	TEKTRONIX INC	43- 69	62 3/8	-2 1/2	-3.8
N	TELEK	2- 3	2 3/8	- 1/8	-4.5
O	WANGCO INC	11- 22	21 1/8	0	0.0
O	WILTEK INC	2- 2	1 7/8	- 7/8	-51.8

SUPPLIES & ACCESSORIES

EXCH		PRICE 1976 RANGE 111	CLOSE OCT 13 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED SYSTEMS INC	1- 4	3 5/8	0	0.0
O	BALTIMORE BUS FORMS	3- 3	3 3/8	0	0.0
A	BARRY WRIGHT	6- 10	9	- 1/4	-2.7
O	CYBERMATICS INC	1- 1	1/2	0	0.0
A	DATA DOCUMENTS	23- 43	45 1/4	+ 1/8	+0.2
O	DUPLEX PRODUCTS INC	13- 24	15 5/4	- 1/4	-1.7
N	ENNIS BUS. FORMS	6- 8	5 7/8	- 1/4	-4.0
O	GRAHAM MAGNETICS	8- 15	10 1/2	+ 3/4	+7.6
O	GRAPHIC CONTROLS	13- 19	13 1/2	- 1/2	-5.1
N	3M COMPANY	33- 66	61 1/4	-1 1/4	-2.0
O	MOORE CORP LTD	33- 51	32 3/4	- 1/4	-0.7
N	NASHUA CORP	11- 18	16 3/8	- 1/8	-0.7
O	STANDARD REGISTER	13- 19	16 5/4	+ 1/4	+1.5
O	TAB PRODUCTS CO	5- 11	9 1/2	- 1/4	-2.3
N	UARCO	20- 23	20 1/8	0	0.0
A	WABASH MAGNETICS	4- 9	8 5/8	+ 5/8	+8.0
N	WALLACE BUS FORMS	19- 23	22 1/8	+ 1/8	+0.5

The inventors of magnetic tape just made a better "Winchester."



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NEWSPAPER

DPers in Finance Earning Less

By Catherine Arnst
Of the CW Staff

WILLOW GROVE, Pa. – If you're a DP employee in a bank, insurance company or other financial institution, you're probably earning less than DPers doing the same work in other industries, according to the results of a salary survey published by the Administrative Management Society (AMS).

Systems analysts in the financial industry are paid an average of $24 less per week than the national average of $304 and programmers make $15 less than the national average of $261, the survey showed.

But those two job categories garnered the highest salaries in the manufacturing and processing industry, where systems analysts are paid $21 more and programmers $11 more than the national averages.

AMS surveyed 52,803 DPers in seven job categories employed by 4,895 U.S. companies in five industries. Besides the financial and manufacturing and processing industries, the survey covered retail and wholesale, government and "all other" industries.

The seven DP job categories included systems analysts, programmers, entry-level and advanced computer operators, tabulating machine operators and entry-level and advanced keypunch operators. Salaries quoted were those in effect last Feb. 3.

Between 1975 and 1976, DP salaries increased more than those of the other office workers surveyed, the national averages showed. The largest jump was made by entry-level keypunch operators, whose salaries went up 9.9%.

The salaries of computer operators climbed 7.7%, programmers and systems analysts' wages rose 6.5% and 6.7% respectively, advanced keypunch operators' salaries increased 6% and tabulating machine operators experienced a 4.9% pay increase.

The survey, which was broken down into geographical regions, showed the highest salaries are paid in the western region of the U.S. in every category except tabulating machine operators, who are paid highest in the east central region.

The difference between the average salary in the lowest and highest geographical regions generally hovers around the $20 mark, except for programmers. They receive an average weekly salary of $325 in the west, but their salaries drop $27, to $298, in the west central

(Continued on Page 6)

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CW Looks at DBMS

Data Base Systems To Spawn New CPUs

By Don Leavitt
Of the CW Staff

SAN FRANCISCO – Data base management is leading to the development of a new type of processor – a machine that will make "today's number-crunching systems as obsolete as the dinosaur," Dr. George E. Mueller, president of System Development Corp., said here last week.

This new type of processor – optimized for data base operations – will be developed in the next five to 10 years, he predicted at a seminar sponsored by the American Institute of Industrial Engineers.

CW Special Report on Data Base Management Systems follows Page 32.

Mueller called today's computers "wonderfully efficient at performing complex mathematical calculations," but "woefully deficient at all those storing, sorting and fetching operations that are involved in data base management."

The new type of processor he envisions will have "strikingly different" architecture but not be expensive to develop.

Though Mueller sees "no insurmountable technical barriers" to these new processors, he said legislative confusion over privacy is "a stumbling block that could cause significant delays" in their use.

The Privacy Act of 1974 and various state laws seem based on the idea that, since computers permit better records,

(Continued on Page 4)

'Executive Suite' at Trial

Top IBMers Subpoenaed, Never Testify

By Edith Holmes
Of the CW Staff

NEW YORK – Seven members of IBM's top executive suite – including Board Chairman Frank T. Cary – appeared at the U.S. vs. IBM antitrust trial here last week in response to Justice Department subpoenas.

But they never spoke a word in testimony.

The seven appeared as ordered, one from as far away as Paris, to respond to the "last resort orders" backed by Judge David N. Edelstein. The subpoenas were requested by lead government counsel Raymond Carlson because the Justice Department thought the IBM seven might know something about two IBM documents introduced as evidence at the beginning of the month.

Lead IBM attorney Thomas D. Barr said he was outraged the executives had been called to appear but not called upon to testify.

Tracing the "tortured history" of the two IBM documents, Barr said he relied on an only partially successful weekend search of IBM's files to determine who had written the documents, why they had been written and to whom.

Carlson said he was temporarily satisfied with Barr's explanation and therefore would not put Cary and the other IBM executives on the stand.

The judge, however, was not so calm.

"We have seven witnesses here. What is your call? What will we do? Do you need testimony from these witnesses or will you accept the representation of Mr. Barr that none of them know anything about these two documents?" the judge asked Carlson.

(Continued on Page 6)

Model Predicts Large Oil Spill On East Coast Within 25 Years

By John P. Hebert
Of the CW Staff

WASHINGTON, D.C. – Residents of the northeastern U.S. may see a large pool of oil advancing on their coastal areas within the next 25 years if government computer simulations prove accurate.

Given current drilling and oil cleanup technologies, there is a 23% chance a spill will occur as a direct result of oil drilling in the undersea Georges Bank petroleum fields off the coast of Massachusetts, according to worst-case oil risk analyses performed by the U.S. Geological Survey (USGS).

The results of that analysis, published recently in a 1,200-page report by the U.S. Interior Department's Bureau of Land Management (BLM) here, will be used as the basis of a draft environmental impact statement to help the Secretary of the Interior decide whether to auction off exploratory rights on Georges Bank to U.S. oil companies next spring.

The USGS' risk analyses, made on its tandem 4M-byte IBM 370/155 systems, were only feasible with the aid of large-scale computers, according to Dick Smith, who headed the survey's simulation effort.

The 15.8 million-acre tract was reduced to about 1.73 million acres for oil drilling exploration in response to pleas submitted to BLM from northeastern fishing, recreation and tourism industries after the USGS simulation findings were published, the BLM source said.

Public hearings on the findings will be held in Providence, R.I., in early December, when testimony will be taken from

(Continued on Page 8)

Minicomputers Not Optimized, Hit as 'Thrown Together' Units

By Esther Surden
Of the CW Staff

SAN FRANCISCO – Minicomputers are not designed from a systems point of view – they are "thrown together to solve a problem and, as a result, the system is not optimized," James Toreson of Microcomputer Systems Corp. said at the Mini/Micro Conference and Exposition here last week.

Many mainframe users are finding their way to minicomputers because business needs are information-oriented rather than computation-oriented, he said.

These users are accustomed to high reliability, low downtime and high performance because large-scale systems have these features built in, he said, but they soon learn they are sacrificing performance.

Much improvement is needed to correct this problem, he indicated.

CW at Mini/Micro

Mini users deserve a high mean time between failures, low mean time to repair and good throughput to match the initial low cost of the system, he added. "This requires a global system design that incorporates the features of the memory

(Continued on Page 8)

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Sees Conceptual Gap

Econometrician Questions DP Modeling

By E. Drake Lundell Jr.
Of the CW Staff

HOUSTON – Experience with large-scale computer models "has aroused some concern about the validity of complex systems," an econometrician who keynoted the 1976 National Conference of the Association for Computing Machinery (ACM) here last week said.

Despite doubts about the accuracy of such large econometric models, the push toward them – sired by the computer and damned by at least some – has become "increasingly prominent on the landscape," according to Edwin Kuh, executive director of the Computer Research Center for Economics and Management Science for the National Bureau of Economic Research, Inc.

In the past, models have tended to be small and aggregative. An advanced model of the U.S. economy in 1955 contained only twenty equations, he pointed out.

In the past five years, however, "the enabling conditions in terms of computation were advancing," moving economic models to greater detail and size "as well as more complexity," Kuh noted. "The energy and environmental crises triggered a search for complex answers to complex questions."

CW at ACM

But while the models have been increasing in size and complexity, modeling concepts are based on intellectual disciplines that predate modern computation.

The very existence of large-scale models "carries with it the aura of deeper understanding," he said, but "we ought not to flatter ourselves into the belief a computer model can rise above its intellectual foundations.

"A second real problem" with such models "is the quality of data," Kuh said.

"A model built on 'the best available data' will often in reality depend on low-grade inputs," he noted. Adding results "do not often call attention conspicuously to these flaws."

The cause of the low-quality data is "a simple fact of life" that the concerns and incentives of the data gatherers are only loosely coupled with the requirements for model building and the concerns of the model builders, he said.

Most of the data collected by the government is in response to legislative mandates and has little relation to the needs of the modelers, he emphasized.

Another problem has to do with the trustworthiness of computer software, Kuh said. "Proliferation of code has enabled us to do more things more easily and often better things as well, but sheer complexity raises the specter of not really knowing what is happening" within the systems, he explained.

"Large programs are designed by one or several individuals. Then tasks are assigned, design changes are made – not all of which are recorded. Programmers come and go, but programs remain," Kuh said.

"In these circumstances, programs which are not founded on well understood theory lack verifiability and hence trustworthiness," he contended.

While many of the more glaring errors are caught and "corrected," he said, often "large-scale programs can satisfy some internal logic and hence compute, yet in fact be computing nonsense.

"We might save the day by an intuitive understanding of the problem so absurd answers will be trapped. What concerns me is the existence of code that runs in the technical sense and churns out results that are intuitively acceptable but just plain wrong," he said.

While many econometricians, Kuh included, are excited about the opportunities presented by large computer systems, he said there is still a "large gap between what we really know about socioeconomic systems and our desire to solve the problems of the day."

SP New Owner of Datran Assets After Outbidding Western Union

By Molly Upton
Of the CW Staff

WASHINGTON, D.C. – Southern Pacific Communications Co. (SP) is the new owner of the assets of the Data Transmission Co. (Datran) network.

At the bankruptcy court auction here last week, SP outbid Western Union Telegraph Co. for the Houston to Chicago network with a bid of $4.9 million.

One of SP's first moves was to notify customers using the former Datran Kansas City to St. Louis link that portion will remain operational, according to Rex Hollis, vice-president of marketing. SP had leased this link from Datran before it went out of business.

SP had previously warned these users they might have to find other facilities if SP were unsuccessful in its bid to acquire the network, he said.

Most of these users reportedly had already switched to MCI and other carriers before the auction. SP had been operating the Kansas City to St. Louis link as part of its network on a temporary basis.

Hollis said he was not sure how soon SP could get the entire Datran network up and running since it is subject to certain procedural matters. The transfer of common carrier facilities must be approved by the Federal Communications Commission (FCC).

Stanley J. Samorajezyk, trustee in bankruptcy for Datran, said he and SP will probably make a joint application to the FCC for authorization to transfer the licenses issued by the FCC.

SP plans to carry the "best combination of voice and data" and is also considering a number of other services, Hollis said. He anticipates the network's operation will be integrated into the basic SP system.

The $4.9 million will be paid to the bankruptcy proceedings and applied first to secured creditors and then to unsecured creditors, Samorajezyk said.

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CORRECTION

"Is it true that almost half the 50 largest firms sort with SyncSort?"

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2	General Motors
3	Texaco
4	Ford Motor
5	Mobil Oil
6	Standard Oil of California
7	International Business Machines
8	Gulf Oil
9	General Electric
10	Chrysler
11	International Tel. & Tel.
12	Standard Oil (Ind.)
13	U.S. Steel
14	Shell Oil
15	Atlantic Richfield
16	Continental Oil
17	E. I. du Pont de Nemours
18	Western Electric
19	Procter & Gamble
20	Westinghouse Electric
21	Union Carbide
22	Tenneco
23	Goodyear Tire & Rubber
24	International Harvester
25	Occidental Petroleum
26	Phillips Petroleum
27	Union Oil of California
28	Bethlehem Steel
29	Caterpillar Tractor
30	Eastman Kodak
31	Rockwell International
32	Dow Chemical
33	Kraftco
34	RCA
35	Esmark
36	Sun Oil
37	LTV
38	Beatrice Foods
39	Xerox
40	United Technologies
41	Greyhound
42	Firestone Tire & Rubber
43	Boeing
44	General Foods
45	Ashland Oil
46	Monsanto
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48	R. J. Reynolds Industries
49	Litton Industries
50	Lockheed Aircraft

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Charges Seventh Amendment Violated

Catamore Asks Appeals Court to Reconsider IBM Case

By Molly Upton
Of the CW Staff

BOSTON — Catamore Enterprises, Inc., awarded $11.4 million in a suit against IBM, has asked for a rehearing on a recent appeals court ruling that both voided the court's decision and called for a new trial [CW, Oct. 4].

Catamore is prepared to take its case to the U.S. Supreme Court because it believes its right to trial by jury, guaranteed by the Seventh Amendment to the Constitution, was violated, according to Thomas K. Christo, Catamore's attorney.

In its petition for a rehearing, Catamore also charged the U.S. Court of Appeals for the First Circuit incorrectly cited dates pertaining to the timeframe during which Catamore was eligible to file complaints against IBM.

In addition, the Catamore brief alleged District Court Judge Raymond Pettine's charge to the jury which brought in the original verdict constituted an "invited error" — something the appeals court also noted.

The Court of Appeals had no right to assume what the jury did or did not find in arriving at its decision to award Catamore $11.4 million and IBM $68,453, according to the brief.

"Surely, this court cannot say which version the jury had to believe. Yet that is what it has done, and this assumption of the jury's role in violation of the Seventh Amendment is a necessary prerequisite for the court's present opinion. Therein lies the error," the Catamore brief said.

Of significance in the appeals court ruling was a written Systems Engineering Services (SES) agreement, over which there was controversy as to whether it superceded a prior oral agreement for SES.

In its decision, the appeals court vacated the jury's finding on the basis that a written contract signed with IBM specified a one-year liability and that this limitation applied to a previous oral SES agreement as well. Catamore did not take action within that timeframe, the court said.

The appeals court therefore ruled the district court erred in permitting the jury "to find both that the SES agreement was valid and that IBM was liable to Catamore for having breached the two oral agreements," Catamore said.

In its decision, the appeals court also disapproved of part of Pettine's charge to the jury, which was submitted by IBM and to which IBM did not later object.

The judge told the jury that "if you find that the subject matter of the alleged oral contract was sufficiently differentiated from the subject matter of the SES agreement so that the latter was not intended as a substitute for the former, then you may consider such oral agreement in determining whether and to what extent IBM is liable to Catamore for breach of contract based on its alleged failure to furnish Catamore with a totally integrated computerized system."

'Invited Error'

Catamore categorized this as an "invited error," noting the appeals court said "the judge improperly permitted the jury to conclude that the SES agreement, if not voided by fraud, had no effect on Catamore's claims of breach of the 1968 and 1970 [oral] contracts."

The Catamore brief also argued the 1970 SES agreement may be invalid on several points, including the fact it was never accepted by IBM.

The appeals court, when investigating the facts presented to the jury, incorrectly cited such critical items as dates, according to the Catamore brief.

Under the terms of the agreement limiting liability to a year, the plaintiff is allowed one year after the "accrual of the cause of action" in which to file a complaint, Catamore said. This means one year from the point at which the plaintiff should be aware he has no other course, sources indicated.

In the Catamore case, this would extend the date for a year after Jan. 31, 1972, when IBM responded to Catamore's complaints by meeting with Catamore, according to the Catamore brief.

"Therefore, in the light of the record, it is simply not true for either of the contract causes of action that '. . . in any case it was more than a year before the filing of Catamore's first counterclaim,' " the Rhode Island user said.

Among the items Catamore cited as assumed by the appeals court in contradiction to evidence was the subject of the oral 1968 SES agreement, which IBM said was for systems design and which the court categorized as a completely designed and programmed turnkey production control system.

Catamore asked in a footnote in its brief, "How can this assumption be harmonized with the court's correct observation two pages earlier [that] '. . . we have no way of knowing either the factual assumptions the jury made or the theories of liability it found persuasive'?"

The appeals court may deny Catamore's petition; order a reargument; or deny the petition, withdraw its opinion and issue a new opinion without a hearing, sources said.

Data Base Systems Seen Spawning New CPUs

(Continued from Page 1)

they are a growing threat to personal privacy, Mueller said. A literal reading of the laws implies data bases should not be maintained at all, he added.

The "basic illogic" in that situation makes it apparent "legislators, at least, do not fully understand how processors work," he continued. "Certainly there is no technical reason" why a system of shared files such as the data base processors would entail "could not be designed without compromising privacy."

Almost as an aside, he said a citizen "probably has more privacy with electronic records than he did with the old system of hard-copy records, but there is great concern that a citizen's records will be abused" if they are on a computer. The privacy issue is further complicated by legislative requirements for full government disclosure, he noted.

"I confess I do not know" how they can be reconciled with full privacy, he said, adding "there are no signs yet" that "pressure groups or legislators are taking a fully rational view of the issue" to create legislation that will curb abuses without halting the "natural growth of the electronic age."

All growth so far has been toward enhancing the computational power of systems, he said, even though the tasks the users have been giving the systems to perform are "90%" mundane data management operations.

"In other words," he explained, "the computer industry has gone through three generations of development to perfect machines optimized for 10% of the workload."

The executive routines, operating systems and memory configurations are "carefully tailored" to meet the requirements of complex arithmetic calculations, Mueller said, and "adding a data base access function today involves a contest between the programmer and the computer.

"The computer invariably wins such a contest. The programmer must resort to convoluted paths and excessive time and storage just to enable his company to keep track of inventory," he said.

New system architecture "must allow for the fact that tomorrow's systems will be used by clerks, not programmers . . . In effect, the system should respond to the clerk just as if [the system] were another person," Mueller said.

The second major area of development must be the storage medium itself, he said: "We cannot afford to rely on electromechanical devices such as disks and magnetic tapes much longer . . . Fortunately, we are on the verge of a breakthrough in memories," he added.

Typically the systems will have geographically dispersed elements linked by voice-grade communications lines, Mueller said. "The processing elements will undoubtedly be distributed, with intelligent terminals accessing a common data base."

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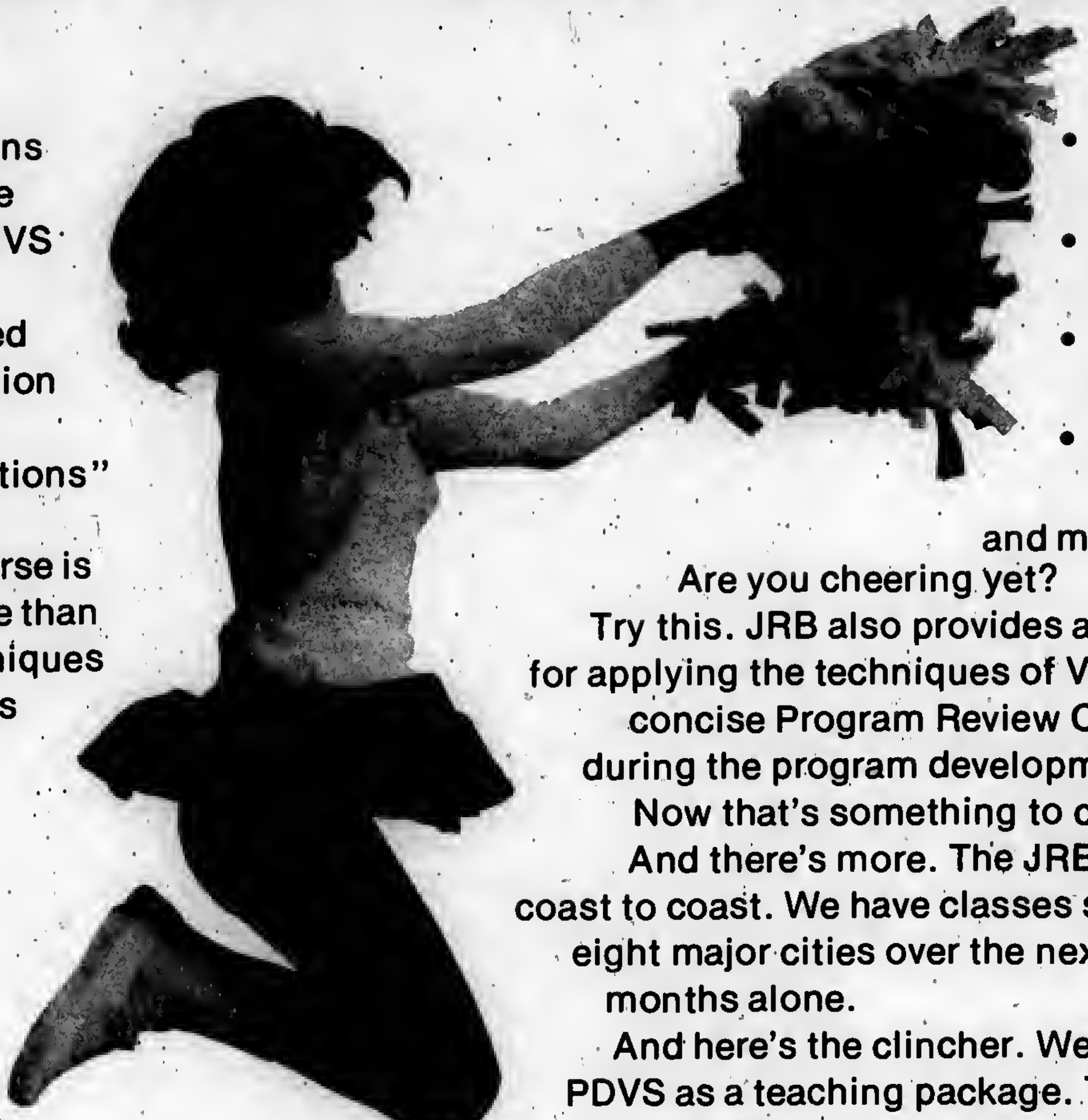

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Seven IBMers Called to Court, Never Called to Stand

(Continued from Page 1)

Rejecting Carlson's request to keep the IBM executives under subpoena until the government had a chance to review the information Barr provided in court, Edelstein released Cary and the other six men.

In addition to Cary, those called to appear in court were Hilary Faw, IBM assistant treasurer; L.I. Spector, IBM consultant; J.J. Forese, IBM's president of Office Products Division; G.A. Garry, manager of small commercial systems, General Systems Division, Rochester, Minn.; R.A. Somerby, Data Processing Division branch manager, New York; and H.B. Farr, vice-president and general counsel, IBM Europe S.A.

The subpoenas called for IBM counsel "to pull people into this city to look at thousands of documents" in the space of four days, Barr noted. The government's action was "nothing more than a case of blackmail," he said, adding he hoped the bill for witness fees and mileage would cause some difficulty in Washington when it arrived.

Barr said he and his staff had gone through more documents and depositions in the last few days than could be presented to the court in six months. He suggested IBM counsel shouldn't have to do all the government's work for it.

Stating he resented Barr's remarks "very much," Carlson said the government was only trying to get at the facts behind the documents, both of which dealt with "Project Yardstick" – an IBM effort in the late 1960s to revise its means of measuring market share.

Carlson called these documents "important" to the government's contention that IBM instituted Project Yardstick at the time the Justice Department first filed the antitrust suit in 1969 because the corporation knew its earlier measurement policies and practices showed it had a monopoly share.

IBM's claim of privilege for portions of the documents confused the government's receipt of them in the proper form and illustrated "the advantage to a corporate defendant of the tool of privilege to delay a trial proceeding," Carlson said.

The facts concerning the documents were what Carlson wanted, and he stated he wasn't in a position to withdraw the subpoenas until he had that information. Barr's presentation concerning the two documents had answered many questions, he told the judge.

Having listened to both attorneys, Edelstein, who is hearing the case without a jury, suggested they go to the record to see what he tried to accomplish in ordering that members of IBM's executive suite be called into court in the first place.

Before the judge even mentioned the subpoenas, he suggested both sides meet with the intention of clearing up the problems created because the documents had no stated authors and, in one case; no addresses or date. The judge reminded the adversaries he had urged the parties to come up with a solution that "would meet the convenience of IBM and of the government."

Edelstein ordered subpoenas only as a last resort in the event the attorneys for the Justice Department and IBM could not cooperate, he noted.

"In all my experience of nearly 25 years on the bench – and even in criminal cases – I have never seen such obvious stubborness and stonewalling," Edelstein said.

"Goodwill and professional ethics require that you get together," he continued. Referring to the use of terms like "blackmail," Edelstein said the parties "don't bring credit" on their profession, themselves or their clients.

In addition, the judge accepted Barr's offer to spend one afternoon with the government to iron out the problems behind "laying a proper foundation" for the hundreds of documents both sides eventually hope to put before the judge as evidence.

Your Place or Mine?

NEW YORK – In response to Judge David N. Edelstein's suggestion that the lead attorneys in U.S. vs. IBM meet to stipulate, or agree upon, two disputed documents entered into evidence in support of the government's case against the corporation, the two attorneys did meet and at week's end their stipulation was in the process of being drafted.

First, however, the parties had to negotiate where they would meet.

Lead IBM counsel Thomas D. Barr invited lead government counsel Raymond Carlson to his offices; the government attorney expressed some reluctance.

Barr responded by stating his "first concession" to Carlson would be to meet in the Justice Department offices here.

In the end, the meeting was held in Barr's offices after all. The government doesn't have a conference room.

Survey Shows DPers Earn Less in Finance

(Continued from Page 1)

east central sections of the country.

The national average for that position is $261.

Keypunch operators earn the least of all DP employees and are among the lowest paid of all categories of office workers, AMS found. The average weekly salary for an entry-level operator is $145 and most are paid lower than that, the survey showed.

The only office workers with average earnings lower than keypunch operators are mail clerks, entry-level general clerks and bookkeeping machine operators, according to AMS.

Systems analysts, however, are paid higher salaries than any other type of office worker included in the survey. They are also paid about $50 more on the average than programmers, the next highest paid DP employees, in all regions except the east, where they are paid approximately $30 more.

Within each DP position included in the survey, the difference in average salaries is usually between $10 and $20, except for analysts and programmers.

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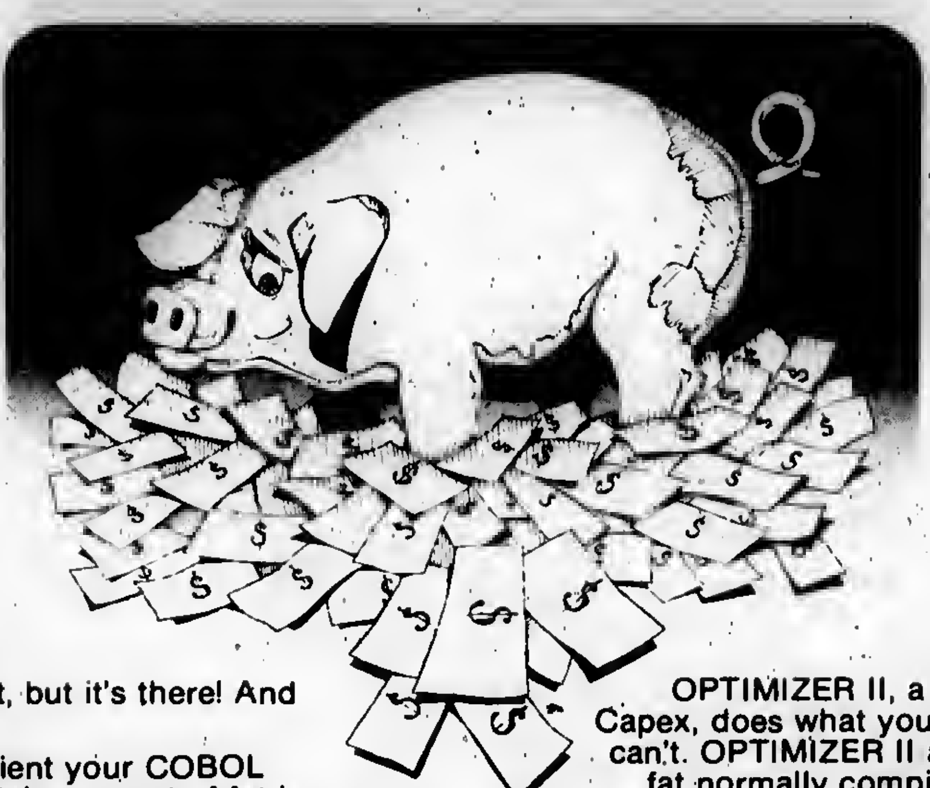

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Model Predicts 23% Chance of East Coast Oil Spill

(Continued from Page 1)

parties opposed to oil development efforts, he noted.

The IBM mainframes and California Computer Products, Inc. drum and flatbed plotters ran 32,000 hypothetical oil spill trajectories from 16 different locations on Georges Bank, an area crucial to New England's fishing, tourist and recreation industries.

However, the 15.8 million-acre undersea tract may also be crucial to energy availability in the Northeast, an area hit hard during the 1973 Arab oil embargo.

Besides the 23% chance of an oil spill, the USGS computer simulations also came up with other statistical probabilities. Among them, a BLM spokesman noted, was a 62% chance a spill would eventually reach beach or recreation areas from northern Maine to New York City if no attempt were made to clean up the surface slick and a 35% chance a spill would occur between November and April because of strong wind and ocean currents prevalent at that time of year.

In addition to these findings, he said, there is a 90% probability two spills involving 42,000 gallons or more will spring from an undersea rig or oil pipeline to the mainland within five years after exploration has begun.

The BLM spokesman indicated the 23% figure is the most accurate because advances in oil spill and drilling technologies were not taken into account by the USGS models.

"Oil companies don't want spills because the spills cost them $1,000 per day" and the public reaction to poor cleanup efforts hurts them, he said, so the development of new technology is to the oil companies' advantage.

"The study represents a larger computer effort than mental effort," USGS' Smith said.

USGS used the Monte Carlo model to predict and describe all the random behavior of winds and currents which could affect oil spills if they occur, he said.

'Crash Effort'

To get the data requested by BLM for the North Atlantic region study, a three-man USGS staff "worked overtime on a crash effort" with the dual 155s, Smith said. The mainframes talked to each other, although there was no resource sharing to any extent, according to Jim Slack, mathematician and programmer on the project.

Data was collected on the area under study from the national and state governments and private sources and input via a remote, in-house Data 100 Corp. Model 78 high-speed terminal connected to the CPUs by a 9,600 bit/sec dedicated line.

The "large batch terminal" included a console, two tape drives, a card punch/reader and a 600 line/min printer, Slack said.

After the preliminary data was processed, it was digitized in a 480- by 480-unit matrix format on "an old Bendix Datagraphix digitizer," put into the form of coordinates and input to the system, he explained.

USGS, Smith said, operated under "a tremendous constraint" in developing the computerized analyses because it promised BLM the results of the information gathering, digitizing and DP effort in four weeks.

Poor Reliability Seen In Design of Minis

(Continued from Page 1)

peripheral."

Designers must work on the operating systems on minis; many minicomputer disk systems require complete backup because of a lack of audit trail recovery capabilities, Toreson said.

Current memory peripherals available in the mini world use an "ultra-IBM 3330 with high bit density" technique, and more than 80% of the cost in a typical system is in the peripherals, he said.

To make the disk systems less costly, the controller and drive electronics have been pared down to a minimum. Users lost high-flying head heights and gained poorer filtrations resulting in lower reliability with an increase in head crashes, he said.

The systems also lack adequate diagnostic features and have "zero marginal test capability," Toreson added.

Controllers lack error correction and diagnostics. In many controller designs "you find the computer is being utilized for the control function itself, rather than a true controller," Toreson said.

The result is lower cost, but at the price of poor reliability and poor maintainability, he said.

The mini world needs reliability and maintenance built in because "field support is not as good as in the maxi world," he said.

Buses Too Numerous

With disk drives connected directly to the control unit, there are "really too many buses in the system. People are becoming more and more aware that cables cost money," Toreson said.

A lot of the electronics in the disk systems is "ill-thought-out," he added. "We need to look at it and minimize it."

Since cable is so expensive, the controller could be integrated into the drive, especially with the advent of microcomputer technology, he suggested.

A disadvantage of this is that drive expandability becomes a problem because there is no bus, he noted, but the cost of microcomputers is coming down to the point that even duplicate electronics for each drive could replace cable economically.

Another way to improve reliability would be for the controller to be incorporated into the host; this would eliminate one set of buses but allow the drive buses for expandability, Toreson explained.

In the future system, the controller itself could incorporate diagnostics to conduct self-testing and memory device marginal testing, he indicated. There is also no reason, Toreson added, why "channel concepts" such as those used between large computers couldn't apply to the smaller ones.

Changes in the media are taking place as well, Toreson said. "We are seeing what I call the hubrid disk, with not only moving heads but heads per track.

"We also see lots of fixed media, which represents a problem because operating systems are not knowledgeable about this kind of drive. You need a tape backup."

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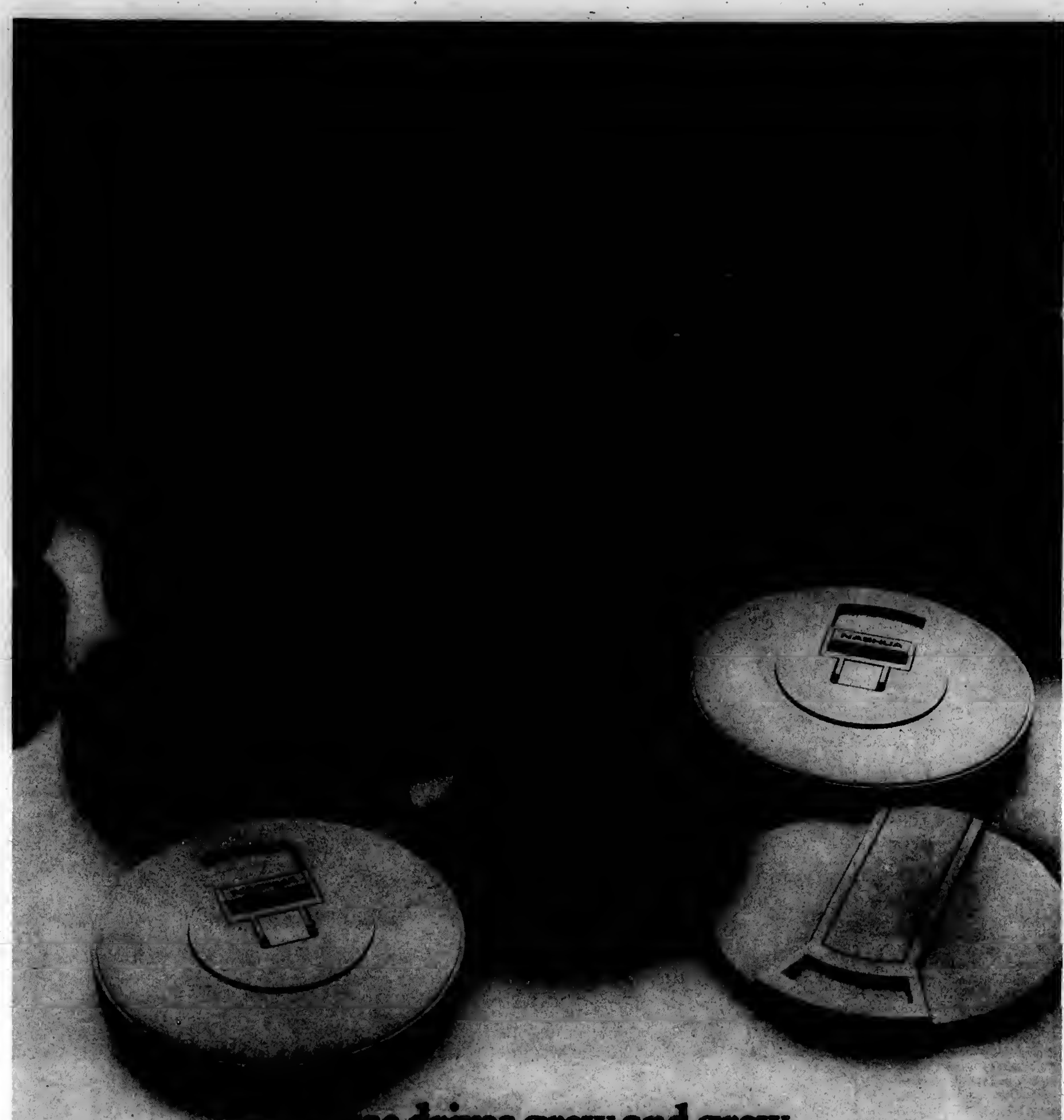

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Full Potential of POS Not Realized, Panelists Agree

By Toni Wiseman
Of the CW Staff

PHOENIX – Is there life after POS?

That is the question a panel of consultants tried to answer for attendees at the National Retail Merchants Association's annual DP and Data Communications Conference here recently.

In the early 1970s, projections were made on the number of terminals and personnel that point-of-sale (POS) installations would eliminate, but few of those projections have been met, according to Otto Becker of Arthur Andersen and Co.

"A few people have realized very, very large benefits in the personnel area, but these are really soft dollar benefits. Hard dollar benefits on the selling floor have yet to be realized," he said.

In the back office, it is a far different matter, he asserted. Sales reporting costs are way down, register balancing costs have seen major gains and there has been a positive impact on credit applications, he said.

"Another major area which was overlooked but which has been positively impacted is the billing process. Speeding up the billing process generates cash which can offset part of the investment in POS, he added.

"If you started out with a couple of hundred dollars to invest and had several options, POS would probably not be your first choice," Becker said, "but I would certainly not discourage you from considering it."

Leslie Chick, senior consultant for Touche Ross & Co., agreed, noting many firms are putting POS terminals in new stores but using them in the traditional stand-alone mode rather than on-line.

"The 'total' system is not here yet, despite what some retailers and vendors say," he added. Chick defined the total system as one which closes the retailing loop.

"The total system is one which will achieve interaction between DP and the user departments and impact the bottom line. The only total systems that exist today are a combination of manual and DP systems," he said.

Excess Technology

Joseph Lev, a principal with Cresap, McCormick and Paget, Inc., said what the retail industry has seen to date is an excess technology capacity.

"This excess has gotten us to where we are, but that is not the stimulus which will make us change. The stimulus will come from user requirements, not manufacturers' excess capabilities," he stated.

Lev also commented on the advent of information utilities in retailing or third parties. These, he said, will often be banks or service organizations with large systems.

Following the theme of the session – the current status of POS – Lev noted one chain, Fortunoff's, has deviated from the "basic" POS application.

Finding that 40% of its stores' transactions were on credit and therefore required either a phone call or credit touch-pad step to complete a sale, Fortunoff's tied its NCR 280 terminals to a CPU at its data center. From the center, data is transmitted over leased lines to an NCR computer at the Chase Manhattan Bank and then to the bank's IBM 370 for processing.

While this has not reduced the number of registers or sales personnel at the stores, it has given them an on-line credit authorization system with response time of less than one second, Lev said.

Seven Questions Urged on POS

PHOENIX – By answering seven questions, a retailer considering a point-of-sale (POS) system can cover 10% of his planning effort and possibly save a lot of money, Joseph Lev, principal at Cresap, McCormick and Paget, Inc., told attendees at the National Retail Merchants Association conference here recently.

The seven questions are:

- Has the company agreed on an objective for the POS system?
- Are present systems installed compatible with POS requirements?
- What is the most effective POS configuration for the store?
- What features are desired?
- What costs will be incurred and what are the capital requirements?
- What human resources are available to support POS development?
- What benefits will be achieved by implementing the POS system?

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Not Just Matter of Semantics

'S' in 'EFTS' Should Stand for 'Services': Banker

By Toni Wiseman
Of the CW Staff

PHOENIX – To be successful, EFTS must be desirable from the customer's point of view, George C. White, vice-president of the Chase Manhattan Bank, said here recently.

While the term "EFTS" was initially considered to stand for "electronic fund transfer systems," White told the National Retail Merchants Association he prefers the newer idea of "electronic fund transfer services."

" 'Systems' indicates a hardware orientation, while 'services' connotes a user focus," he explained. "It is more than just a matter of semantics – it is a matter of emphasis."

Some EFT systems such as cash dispensing machines or Touch-Tone phones can be designed from a technical viewpoint, but many retailers and bankers have realized the focus today is on EFT services "that are attractive to both the corporation and the individual consumer, yet economical to offer," he said.

Methods Under Development

Chase, like many other banks, has efforts under way to interface with retailers' electronic cash registers. While this is an alternative method for consumers to pay for point-of-sale transactions, it must be kept in mind it is not the only type of EFT service under development, he cautioned.

The Federal Reserve system's wire network on Fed Wire, Bank Wire and the New York Clearing House Interbank Payments System (Chips), which is transferring over $1 trillion monthly, have been operational for a number of years and are electronic or EFT, he said.

By late 1977, both Bank Wire II and the Society for Worldwide Interbank Financial Telecommunication (Swift) networks will be operational, he added.

In addition, the automated clearinghouse (ACH) environment will change the way payments are made – a system that now involves 30 million checks annually, he said.

"There is not a single EFT capability, but rather a multitude of approaches and options available to our customers," White said. "In my opinion, the most economic alternatives will determine the way EFTS develops."

Option, Not Command

Consumer advocates often have taken the view that EFTS is bad for consumers, alleging consumers have given up control over paying their bills by preauthorizing payments, White noted.

"This is sheer nonsense. It is like saying that because we have helicopters, everyone has to commute to work by helicopter. Actually, helicopters simply offer another transportation alternative," he said.

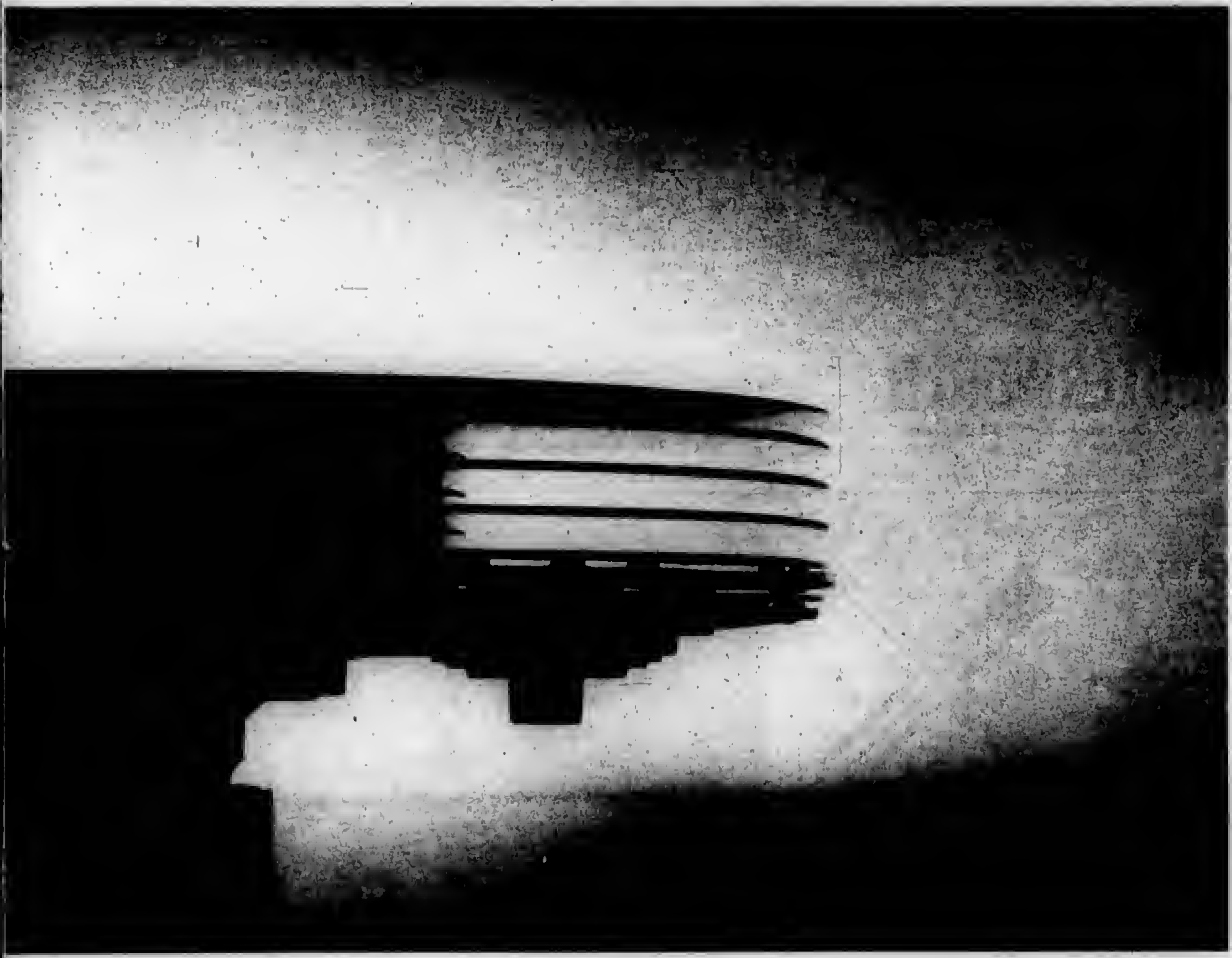
"EFT is similar in that it offers additional options for making a payment. Too often, the consumer advocates forget nothing can happen in a financial transaction unless the persons responsible for a bank account take some action," White stated

It would be much cheaper to pay small corporate dividends electronically than expend money to prepare checks and mail them, even considering the float lost by paying electronically, White said.

Direct Payment

Assuming an individual or company would like to be paid electronically, what is necessary? The customer would have great difficulty making an electronic payment today because he would not know the "banking address" to send it to – that is, the routing and transit number identifying the corporation's bank and the corporation's bank account, White said.

If corporations identified the corporate account to which they wanted their customers to send payments, the automated clearinghouse standard data formats could get both the payment data (e.g., customer's account number) and the funds transmitted to the corporations' bank accounts for subsequent daily transmission to their accounts receivable processing function, White stated.



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Computerworld's November 29th issue will include a special report, edited by Ron Frank, on *Data Communications Network Configurations*. The supplement can show you some of the right ways to plan your network -- and how to avoid common pitfalls. In addition to case studies and commentary from well-informed users who understand the data communications environment with all its implications, you'll find applications stories and tutorials on the equipment, carrier services, line protocols, teleprocessing software, etc. that's available to make up your system.

So whether you're building a network or managing one, you'll find important and useful information in the November 29th *Computerworld*. And if you're marketing data communications products or services, you should advertise to your audience here. The ad closing date is November 12th. Talk to your *Computerworld* salesman for complete details. Or call Judy Milford at (617) 965-5800.

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Calendar

Nov. 1-3, San Diego, Calif. – **1976 Position Location and Navigation Symposium**, sponsored by the Institute of Electrical and Electronics Engineers. Contact: Nelson Harnois, vice-chairman, Cubic, 9233 Balboa, San Diego, Calif. 92123.

Nov. 3-5, New York – **Eastern Regional Operations and Automation Workshop**, sponsored by the American Bankers Association (ABA). Contact: Meeting Registration Coordinator, ABA, 1120 Connecticut Ave. N.W., Washington, D.C. 20036.

Nov. 3-5, Pasadena, Calif. – **Caltech/Jet Propulsion Laboratory Conference on Image Processing Technology, Data Sources and Software for Commercial and Scientific Applications.** Contact: Gunther H. Redmann, 171-104, Jet Propulsion Laboratory, 4800 Oak Grove Drive, Pasadena, Calif. 91103.

Nov. 4-5, Fresno, Calif. – **1976 California Educational Data Processing Association (Cedpa) Annual Conference.** Contact: Ellen Landers, 1976 Cedpa show manager, 17123 Chatsworth St., Granada Hills, Calif. 91344.

Nov. 5-8, Los Angeles – **Health Care Information: Data Recording and Retrieval**, sponsored by the University of California at Los Angeles (UCLA). Contact: Health Sciences, UCLA Extension, P.O. Box 29902, Los Angeles, Calif. 90024.

Nov. 7-9, Andover, Mass. – **Electronic Publishing**, sponsored by the Institute for Graphic Communication (IGC). Contact: Richard D. Murray, director of conferences, IGC, 375 Commonwealth Ave., Boston, Mass. 02115.

Nov. 8-11, Coronado, Calif. – **The Third International Joint Conference on Pattern Recognition.** Contact: Pattern Recognition, P.O. Box 639, Silver Spring, Md. 20901.

Nov. 8-11, Chicago – **Info '76, the Exposition and Conference for Information Management.** Contact: Clapp & Poliak, Inc., 245 Park Ave., New York, N.Y. 10017.

Societies/ User Groups

Nov. 10-12, Alexandria, Va. – **Association of Computer Programmers and Analysts (Acpa) Sixth Annual Conference.** Contact: Acpa-6, T-3, 7708 Hanover Parkway, Greenbelt, Md. 20770.

Nov. 16-18, Dallas – **Computer-Aided Design and Computer-Aided Manufacturing IV Conference & Exhibits**, sponsored by the Society of Manufacturing Engineers (SME). Contact: Technical Divisions, SME, 20501 Ford Road, P.O. Box 930, Dearborn, Mich. 48128.

Nov. 19, Gaithersburg, Md. – **"Trends and Applications: Computer Networks,"** sponsored by the National Bureau of Standards. Contact: Computer Networks, P.O. Box 639, Silver Spring, Md. 20901.

Nov. 18-20, Costa Mesa, Calif. – **California Educational Computing Consortium (CECC) Annual Conference.** Contact: Harper Hall, Claremont, Calif. 91711.

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Texas Developing System To Chart Antitrust Activity

AUSTIN, Texas – The State of Texas recently received a $283,000 federal grant to establish a computerized system for monitoring anticompetitive activity.

The Law Enforcement Administration Agency (LEAA) financed the grant for the system, which will act as a pilot program for other states to adapt.

It should be completely implemented within 18 months on the state Board of Control's Digital Equipment Corp. Decsystem-10, according to Michael Barron, assistant chief of the state attorney general's Antitrust Division.

The system will consist of three parts. One will monitor areas in which the Board of Control (the purchasing agency for state contracts) purchases heavily, one will serve as a litigation support system for antitrust lawsuits brought by the state and the third will act as an econometric model for determining the "but for" price of a commodity.

This is the price a commodity would cost "but for" anticompetitive actions and is used by the state to determine the amount of damages levied against a company, Barron explained.

Texas is currently in the process of hiring two new employees, an attorney/analyst and a computer programmer, to develop the system. The state hopes to have a test program running by next summer, when its case against nine steel companies that manufacture steel used for reinforcement will come to trial.

"We will use this case as a guinea pig for the three subsystems," Barron said.

Texas brought three antitrust suits to court in the last two years under Attorney General John L. Hill. In 1959-1960, however, 12 to 15 cases were tried. "We are trying to gear up to that level again," Barron said.

The state passed its antitrust law a year before the Sherman Act was passed and already had the investigative tools the Justice Department obtained last year, Barron said.

"Texas reflects the whole nation" in its tough attitude toward antitrust, he added, citing a study the Federal Trade Commission did three years ago that found anticompetitive actions cost consumers $10 billion annually.

Mini to Monitor Use of Power In Structure Built to Save Energy

MANCHESTER, N.H. – The National Bureau of Standards (NBS) will use a minicomputer-based system here to monitor energy use in what is said to be the first federal building designed especially to save energy.

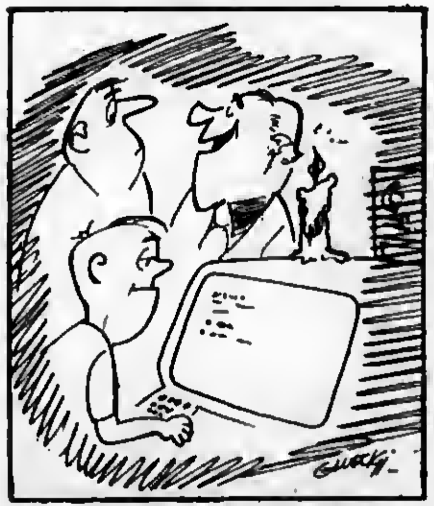
Opened recently to house employees of the Veterans Administration and the departments of Defense, Treasury and Housing and Urban Development, the seven-story building will be monitored for three years.

An array of electronic sensors and gauges will monitor the building's performance at more than 700 points, according to an NBS spokeswoman.

The system will measure such things as temperature, humidity, air and water flow, solar radiation, electric power consumption, barometric pressure and indoor illumination, she said.

Data will be fed to a Johnson Controls, Inc. JC/80/45 modified to NBS specifications and recorded on magnetic tape.

It will then be read into a Univac 1108 at the NBS Laboratories in Gaithersburg, Md., to obtain weekly summaries.



'We Cut Energy Consumption Where We Can . . .'

The building has solar collectors on the roof integrated with more traditional heating and cooling systems as well as six other heating and cooling systems on different floors for purposes of comparison.

It is also equipped with several combinations of artificial and natural illumination to evaluate office workers' reactions to different types of lighting, NBS said.

Weather data will be tied in with equipment performance to clarify variations between predicted and measured values, NBS said.

Nasa to Launch CPU Into Space

CAPE CANAVERAL, Fla. – A small onboard computer will be used to detect and store gamma ray bursts when a High Energy Astronomy Observatory (HEAO-A) spacecraft is launched here next April.

Called the Microscope (short for Small Complementary Metal Oxide Semiconductor Onboard Processor for Experiments), the device was developed at the National Aeronautics and Space Administration's (Nasa) Goddard Space Flight Center.

The system, which was built with CMOS circuitry, was designed to give computing and data manipulating capability to a single satellite experiment or subsystem, Nasa said.

The system contains approximately 150 microcircuits and consumes only 200 millowatts strength of power, weighs about two pounds and is about the size of a shoe box (740 cubic centimeters), Nasa said.

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Below are some of our more immediate needs. K.B. Daly would like to hear from you at Amdahl Corporation, 1250 East Arques Avenue, Sunnyvale, California 94086. We are, of course, an equal opportunity employer m/f.

SYSTEM PROGRAMMER OPPORTUNITIES AT AMDAHL (MVT/SVS/MVS/VM)

Several immediate openings have been created by increased rate in 470V/6 shipments and Amdahl's commitments to its customers to provide unparalleled software support. All of the positions are at Amdhal headquarters on the San Francisco Peninsula, one of the most desirable places to work, live and play in the U.S.

SOFTWARE TECHNICAL SUPPORT

You will work closely with Amdahl field personnel and customers in our Field Support Center to resolve software problems encountered by Amdahl users. The job provides an opportunity to gain in-depth experience with operating systems components while actually shooting bugs. A detailed knowledge of the internals of at least one operating system, and a familiarity with operating systems utilities and SMP are musts for this job.

SOFTWARE SYSTEMS MAINTENANCE

You will develop and maintain 470V/6 model-dependent support for each of the SCPs. Incoming maintenance material is reviewed and generated for redistribution to Amdahl customers. An opportunity to evaluate new SCP function and be involved in program development. A detailed knowledge of operating systems internals and concepts is required, along with a working knowledge of operating systems utilities and SMP.

SOFTWARE QUALITY CONTROL

You will generate, apply, and review all software and materials distributed to users. The job provides an opportunity to operate systems in a hands-on environment. Successful candidates will possess a good working knowledge of operating systems components and operation. Additionally, close working familiarity with operating systems utilities, SMP, and assembler language is a must.

FIELD SOFTWARE OPPORTUNITIES AT AMDAHL

A number of newly-created positions have just opened to work with Amdahl users in the field. Immediate opportunities exist in White Plains, New York; Waukegan, Illinois; Rockford, Illinois; and on Long Island, New York.

FIELD SYSTEMS ENGINEERS

You should have a need to feel useful to Amdahl users in a mixed-vendor environment, and have a propensity for exuding the Amdahl enthusiasm. You must have a firm grasp on software systems, in-depth knowledge of large system internals (OS/MVT, VM, VS2, SVS, or MVS) and excellent diagnostic ability.

HARDWARE FIELD SUPPORT OPPORTUNITIES AT AMDAHL

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Editorials

Doing Watergate Proud

One of the risks of a court suit is that a business has to expose much of its internal documents to public scrutiny. And in case after case dealing with alleged antitrust violations, parties have squabbled about the documents they want to withhold for proprietary and competitive reasons.

In most cases, the courts have ruled that documents be made public unless they are of such a sensitive nature that they affect the corporate viability of a party.

In the upcoming trial of California Computer Products, Inc. (Calcomp) et al vs. IBM, however, the court has issued a gag order which does proud the disgraced tape handler of Watergate infamy.

In effect, Judge Ray McNichols has set conditions which would let either party block documents from press and public exposure without having to explain why [CW, Oct. 11].

If allowed to go unchallenged, this arbitrary decree will result in a secret trial in which the parties pass around documents in a very cozy manner.

The potential for legal abuse in such a trial is staggering. The issue at stake is much more than freedom of the press – it turns on the right of the public to have access to information on the business practices carried on in the computer industry.

It makes no difference whether IBM or the other side is proven right or wrong by the court. If neither of the parties objects to this virtual veil of secrecy, the public – and especially the users – should rightfully assume both sides have dirty linen in the closet which can't stand the light of day.

If this order is not overturned, it will cast a pall that will eventually come back to haunt our American system of jurisprudence.

Standardized Lethargy

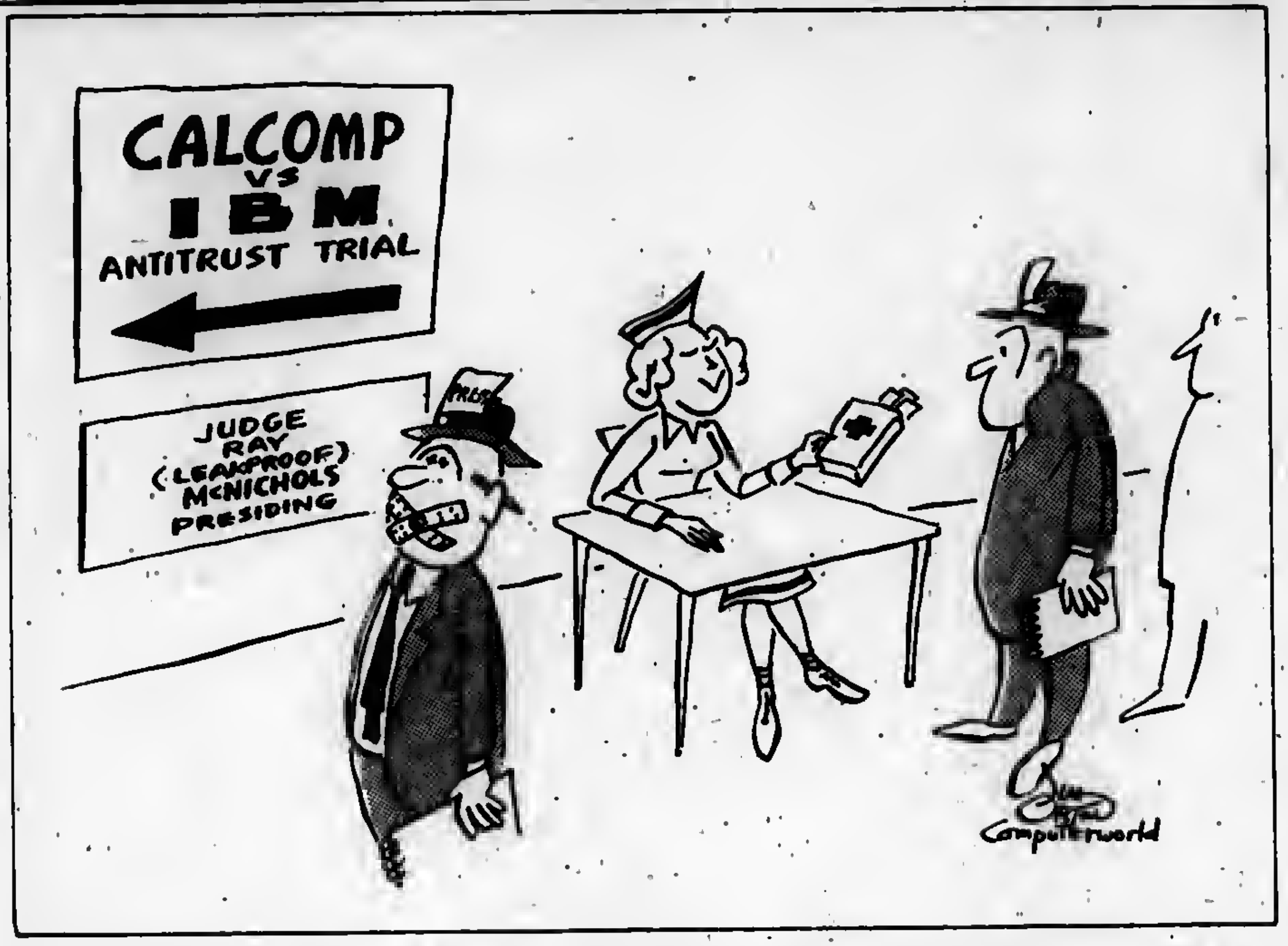
Retailers should be praised for the caution and forethought they demonstrated in planning for the implementation of the voluntary Universal Vendor Marking (UVM) code.

Rather than rushing headlong into the age of terminal-based electronic checkouts, the retailing industry indulged itself with lengthy discussions among vendors, suppliers and consumers. It was thus able to avoid the public lambasting its less cautious – and now repentant – sister industry, the supermarkets, have had to endure.

The praise for retail marking systems is not unmitigated, however.

Even the greatest scannable price-marking standard in the world is useless if there is no widespread implementation to benefit both retailers and consumers.

The retail industry chose its standard two years ago. When are we going to see more widespread signs of its use?



Letters to the Editor

Real World – Not Leavenworth – Holds Most Fraud-Prone DPers

It was distressing to read J. Daniel Couger's attack on Federal Prison Industries' efforts to rehabilitate inmates at Leavenworth through computer programming training ["Prison, College DP Training Courses Ignore Ethics, CW, Oct. 11].

While Couger announced to his class eight years ago that "it would be only a matter of time before some inmate used his computer knowledge fraudulently," to date there has not been one documented case of such abuse involving any graduates of the Leavenworth program. In fact, the story on Page 8 of the same issue told of the exoneration of DP in a well-publicized tax fraud case involving a Leavenworth inmate.

When one sets aside the temptation to find evidence of a link between convicts and computer crime, the empirical evidence indicates the majority of criminally inclined computer specialists are found outside prison walls – perhaps even in places like Couger's classroom.

Robert V. Head

Washington, D.C.

What About Problems of EFT?

"Customers of Ten Banks Now Paying Bills by Phone" [CW, Oct. 11] carried one paragraph that stated simply, "A report is printed for the merchant listing the name, address, account number and payment amount for each customer who directed payment."

In essence this sounds innocuous, but what happens to the merchant's cash capture when the banks are using a turnaround document for processing?

For the present, we only have one bank remitting these payments, but we have received erroneous account numbers, incorrect amounts due, customers with multiple accounts making a single payment and multiple payments with a single account number. All of these problems are no fault of the bank itself because it merely remits as directed.

We would be curious as well as pleased to learn how other "merchants" are meeting this new advancement – electronic funds transfer (EFT).

Mary Louise Mehmert
Utilities Systems Analyst
Miami-Dade Water and Sewer Authority
Miami, Fla.

Grosch as Traveler 'Offensive'

Herb Grosch's column in the Oct. 4 *Computerworld* was greatly offensive.

It probably matters little to most readers that the egocentric "Grand Old Man of Computers" dislikes traveling with "little children" or "just plain ordinary men and women." Perhaps he just doesn't appreciate that the airline industry has made such conveniences available to "undemanding slobs."

Or perhaps he's just been traveling too much recently to still appreciate the real world (of which he is a part – like it or not).

Perhaps the CW editorial staff should review the past few years of letters responding to Grosch's column and calculate what percentage of readers really show other than antagonism toward his comments. Personally, I don't intend to read any more of him.

Besides, what did that column have to do with DP?

William B. Gifford

Salem, Ore.

Data Past

Five Years Ago
Oct. 27, 1971

WHITE PLAINS, N.Y. – IBM "suspended" rental and maintenance increases it had previously announced in deference to President Nixon's policy on price control. Purchase price increases for IBM 370s complied with provisions of the President's order, IBM said, and were to remain in effect.

– – –

DETROIT – Burroughs Corp. introduced the B4700 series of medium- to large-scale processing systems, a series of accounting minicomputers and five system peripherals. The operating systems offered multiprogramming and multiprocessing virtual memory and dynamic allocation of resources.

Eight Years Ago
Oct. 23, 1968

WASHINGTON, D.C. – The Federal Communications Commission (FCC) was asked by the National Retail Merchants Association and Aerospace Industries of America to throw out the Foreign Attachments tariff to the telephone network on the grounds the FCC was not responsive to the provisions of the Carterfone decision. The organizations felt there was no evidence the connection of such equipment would injure the AT&T network and asked that the tariff be struck down before its issue.

– – –

WASHINGTON, D.C. – Contract negotiations between the Federal government and major computer equipment suppliers ended in victory for the General Services Administration (GSA). Working under new powers awarded by the Brooks Bill, the GSA won an improved warranty on the performance of systems and software and set fixed limits on the power of agencies other than itself\to purchase computers.

A Time for Change

What a four years it has been – for the world, for our country, for the computer trade, for me personally! The realities of world energy growth came alive, and dumped every nation on earth upside down. We elected and ejected the worst president in American history. We sent computers to Mars, and put them in microwave ovens. And I climbed off the shelf in Washington, wrote a hundred columns for *Computerworld*, and was elected head of the senior professional society in our nutty business. Amazing!

And there is more, much more, to come. Clearly there has been a pause, a time for reflection, in the last year or so. The aftermaths of Vietnam and the Middle East, the dull penances following Watergate, the peaceable wasteland around The Grim Gray Giant, my own California plateau, all seemed to say "Wait; breathe deep; take a fresh grip; there are bigger rapids downstream."

Next week the pace will begin to quicken. We will have a newly elected president, and almost certainly one committed to change. There will be a lessening of Cold War tensions abroad; Henry K. is tremendous, but how much Metternich can we stomach? There is more to do with Canada and Germany and Japan, with stubborn Russia and hidden China, than just play power games. We have much to offer: friendship, an enormous market, the greatest intellectual infrastructure in human history..Our music, our science – yes, and our horrid fast foods – leap oceans and cultural barriers.

And our greatest tool, the computer technology that you and I develop and promote, is a center of attention. Except perhaps for our surplus grain, nothing we make so attracts our friends and enemies. What opportunities it gives us – what resources! We have food, energy, land, health – and the science and the engineering and the information capabilities to utilize them; the power to plan and to replan; the flexible human talents that, given enough data, will accept and digest and benefit from change.

Almost certainly the Nixon/Ford miasma will be swept away. Almost certainly we will have a rebirth of popular confidence. Almost certainly there will be better techniques, and better technology. There are enormous barriers to pull down or clamber over: we need an energy policy, we need to rework the support of our cities, we have to balance differently the advantages and dangers of corporate bigness.

And in our own area, new Federal initiatives will be possible. Not easy, not guaranteed, but possible. We need to think more deeply about support for research, we need to get DP standards moving again, we need data communications policy, we need to eliminate stupid export controls, we need to look hard at IBM and Bell. We need people in Washington who really care about human rights, who will examine privacy and the other liberties with the eye of a Jefferson or a Sam Ervin, who will support young people, who will plant trees instead of stripping the land, who will put clever software into solar energy research instead of the B-1.

Much of that is conjectural, even after a Democratic victory. There will be plenty of resistance, plenty of disappointment, plenty of budget shortfalls, in a new administration. Georgia was not, is not, an earthly Paradise. There will still be nukeniks in ERDA, shuttle-lovers in NASA, villains in the Corps of Engineers if we elect a dozen Carters. But there will be real hope, real possibility of change. The time is ripe to move again; we know we won't, with Stubborn Jerry. He likes things the way they are. Our whole expertise blossoms because we think things can be better.

I tend to look pretty close to home, in spite of the do-good rhetoric. I see how little comes out of the Bureau of Standards, in spite of good people and good intentions. I see how export controls continue, even after the legal props are withdrawn. I watch the dreary farce in Edelstein's courtroom, and de Butts baring his surprisingly long teeth at the FCC. We could do better, given national leadership. And I hope, in the New Year, we *will* do better. The computers are neutral; they will work for Ford or for Carter; they will work for the Pentagon or for the Disarmament Agency. The computers, and the people who operate them, can do ugly things or good things. I believe that for the next four years, they will do, not just good things, but better – better than we ever have before.

Herb Grosch

This is the final appearance of the Black Hat/White Hat column.

Readers Assess Role of DP in Overbooking Problem

I have received a number of letters about the overbooking problem and, as might be expected, they included various suggestions on how to handle the matter.

But, in other ways, they have raised another point – where DP fits into such matters. This really does come first because, depending on where you feel DP fits in, particular solutions can be found that are either inadequate to match up or too overreaching in assuming every programmer carries the chairman-of-the-board baton with his coding paper.

The Taylor Report

By Alan Taylor, CDP

Two such letters follow. In the first, I have noted the particular positions discussed and would like you to refer to the accompanying questionnaires and note whether you agree with them:

Dear Alan:

Of course, the problem is the no-shows [1]. The current system is grossly unfair since the honest traveler bears the risk and penalty for the dishonest one [2] who plays games.

The traveler with a confirmed booking bears the risk of being bumped because the system has been set up to handle the problem of the no-shows [3].

Why should the confirmed "show" traveler have to bear the risk of loss the airlines suffer due to no-shows? I think it is grossly unfair.

Of course, this is not a computer problem or an optimization problem [4]. While it may be worthwhile to take the policy as given and try to find an optimal solution within these constraints, I think such an approach is characteristically myopic for the computer professional [5]. A computer professional should apply enough thinking power to the problem to see it in its full perspective, then push for more appropriate solutions.

What is the solution to overbooking? Obviously, the no-shows should bear the risk for their petty dishonesty [2,6]. A seat will not be confirmed without a paid ticket.

What theater operator [7] would think of selling a ticket for a performance on the condition you only have to pay for it if you use it?

I would suggest a graduated penalty, based on the number of hours before flight time that the airline is notified a paid confirmed reservation will not be used; no penalty for cancellation 24 or more hours before the flight; 20% loss of fare down to eight-hour advance notice; 50% loss of fare down to four-hour advance notice; 75% loss of fare down to two-hour advance notice; and loss of full fare for no advance notice or notice within two hours of flight time.

Standbys could still take a no-show seat at the last minute, pay a reduced fare with a portion of those funds reducing (not eliminating) the penalty to the no-show.

Obviously, these rates are only suggestive. With such a scheme, the no-shows, who constitute the nub of the problem for those who are bumped, bear the risk [6] of their failure to give timely notice to the airline of nonuse of a paid seat.

In this way, those who play the game of multiple bookings or of changing their plans at the last minute can still play the game – but now they know the cost of the game.

Gordon C. Everest

Well, there is one position and, in many ways, it is being echoed. For instance, here is another letter which seems to be saying the same things in much the same order.

Dear Alan:

I have been following with considerable interest your discussions about the overbooking problem. There is one basic ingredient missing which I believe is the cornerstone of all successful systems work – total design by a team composed of operating and systems people.

As I understand it, the real problem is no-shows. Increased sophistication of computer simulations, per se, isn't going to solve the problem.

Instead of working with effects (overbooking) to solve a cause (no-shows) we should be looking for causes that will reduce or eliminate undesirable effects (no-shows).

I like to think that in the business world we are governed by economic forces. Therefore, to carry our cause and effect analysis backward, we must ask what economic forces are needed to reduce the incidence of no-shows.

One suggestion is that tickets must be constructively paid for *n* days in advance with a cancellation charge of *d* dollars if the cancellation is in the n-day period and possibly a larger charge if the cancellation is by default.

You can only get total solutions when you take a total systems approach using all the principles involved in operating the system.

Chuck Powell

Well, there you have it. Now the question is: Are the positions taken up by Everest and Powell in agreement with your opinion of data processing? If not, what are the differences between them?

Where Are the Overbooking Problems?

The following points are referenced in the Everest letter. In each case you are asked to either agree or disagree by circling Yes or No. Please include your comments in an accompanying letter.

(1) Is the overbooking problem no-shows? Yes No

(2) Is a no-show dishonest? Yes No

(3) Has the current booking system been set up to handle the problem of no-shows? Yes No

(4) Is overbooking a computer optimization problem? Yes, No

(5) Is looking for an optimal solution within constraints characteristically myopic? Yes No

(6) Should the no-show bear the risks? Yes No

(7) Is the theater operator analogy valid for airline overbooking? Yes No

Name ______________ Position ______________

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After completion, please return to Alan Taylor, c/o *Computerworld*, 797 Washington St., Newton, Mass. 02160.

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Reader Commentary

Professionalism Always Good Ploy for DP 'Terrorist'

By Joseph T. Rigo

Special to Computerworld

Arnold took a long swallow from his third martini.

"I'm going to destroy them," he snarled.

We were at the bar of the Hilton Inn in Chattanooga, Tenn. We had both been speakers at a regional conference of the Association for Computing Machinery.

I was there to peddle my ideas about system documentation. Arnold's mission was to pave the way for his employers to take over the U.S. computer market.

"I undermine them," Arnold said. "I make them lose confidence in themselves and their friends."

Most people think Arnold works for a nonprofit research foundation. Actually, he is an international terrorist. He started out as an ordinary bomb thrower, but he was smart and he worked his way up.

"Professionalism is always good," he said. "I tell them they're surrounded by incompetent jerks who chew food with their mouths open.

"Then I sell them a certificate. It's gorgeous. It says 'Competent Digital Professional' in great big letters. Here, you gotta see one . . ."

Arnold reached for his briefcase, but lost his balance. His stool slipped and he dropped to the floor. A band was playing across the room and no one noticed us.

"Have another drink," I said.

Arnold lives in a New York suburb. He likes to get away from the area every once in a while, but he can't handle it. Meeting decent people destroys him.

"It's been bad ever since my book came out," he said. "I've been traveling more and talking more."

Arnold is the author of *Your Systems People Are Robbing You Blind.* It's a big seller in business management circles.

"I got a bundle of money from the National Grants Foundation," Arnold said. "Then I spent a couple of years clipping newspapers and talking to people. And then I put the book out."

The book attempts to convince corporate management and the public that programmers and systems analysts are a bunch of thieves.

Arnold's employers are developing a new line of sand-powered, oil-cooled mainframes. The computers aren't very accurate, but they are easy to use. They are scheduled to be introduced in North America within three years.

"You don't have much time left," I said.

"It's enough," he answered. "My book really has them shaken up. They're putting buzzers on the doors, padlocks on the printers and poison spiders in the tape library. How long can people work with that going on?"

Arnold waved at a young man who walked in and was joining a group at a table.

"Take that guy," he said. "We talked after the meeting today. He's a good guy, and he likes the people he's working with, but he's only human."

Arnold outlined his strategy.

"First I ask how he feels about the government's proposed standards for memory bus speeds in the high-density area. He couldn't care less, of course, but he worries about being a good citizen, so I've got him on the defensive.

"Then I ask if he read the editorial in this month's *Gigomation* about privacy, and he has to admit he failed again.

"And finally I hit him with the clincher. I accuse him of not communicating adequately with top management. He's still on his feet after that one, but his days are numbered."

Arnold's speech was becoming slurred. I took another swallow from my glass of orange juice and looked across the room. There were quite a few people from the conference, and they seemed to be enjoying themselves.

The band began to play "Dixie." There was a yell from the crowd, and everyone started waving handkerchiefs or table napkins.

"I don't understand why these people put up with me," Arnold said. "There are so many remarkable people in the computer business. Look at how much they've done in so few years."

He paused a minute and looked at the people.

"Sometimes, I think they're just not paying attention," he said.

"Have another drink," I said.

Rigo is president of Sysdoc, Inc. in New York City.

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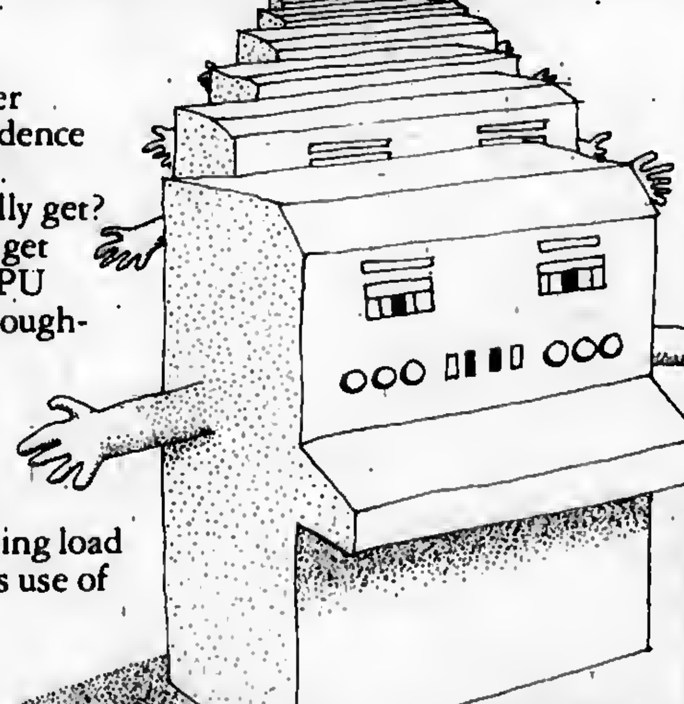

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Survey Finds High Hardware Costs

Users Wish They Had Taken More Time Picking DBMS

By Don Leavitt
Of the CW Staff

DALLAS – If DP managers already using data base management systems (DBMS) were to examine such systems again, they would "very definitely" devote more time and attention to determining the potential impact of the DBMS on their operating environment, according to Marketing & Sales Support, Inc. (MSSI), a local research firm.

They would also examine in more detail the hardware resources that would be "consumed" by the DBMS, MSSI said after conducting a recent survey of more than 350 organizations.

Availability of training and education for the DBMS they might select would be another key area the managers would examine in more detail, make better plans for and actively pursue before moving into a data base environment, MSSI found.

Though the results of MSSI's survey were generally positive, they emphasized the managers' hard-learned lesson of taking a cautious approach to any operation as fundamental as acquiring a DBMS.

The survey found a "high correlation" between real satisfaction with whatever DBMS was finally installed and the preparation of a formal request for proposal (RFP) from various vendors and the running of a benchmark for the proposed systems.

Presumably the formality of an RFP would force the potential user into clarifying exactly what the DBMS was expected to do for the using organization, while the benchmark would clarify how well the proposed system would actually perform.

Typically, when benchmarks were run before installation, the chosen system performed as well in production mode as the test runs indicated it would, MSSI said.

Once installed, DBMS generally have improved the quality of the users' application system design and, at the same time, reduced the system design, programming and implementation time frames, the survey found.

Some Problems Experienced.

But there were some problems, too. Anticipated improvements in throughput, for example, "were not generally being experienced," according to MSSI.

In addition, planned reductions in the size of the users' data files did not take place as often as expected, the survey found. Data redundancy had been reduced as anticipated, the researchers said, but "the recovered storage space appears to be consumed by the DBMS overhead."

Bearing down on that point, the report said respondents generally "saw requirements for substantial improvements with respect to the operating characteristics" of the systems.

Focusing on how well programmers relate to DBMS, MSSI said programming of new applications as well as the maintenance' of existing ones "appears to be improved with the utilization of DBMS.

"Teleprocessing systems were implemented in larger numbers within shorter time frames where data base environments exist," the researchers added, but MSSI did not elaborate on that piece of information, leaving it to the reader to wonder what causes the growth in on-line work in a DBMS setting. Is teleprocessing system development easier because of the data communications software that often accompanies today's DBMS?

Or have the organizations that have gone to DBMS simply reached the point in their DP growth at which teleprocessing applications seem necessary, regardless of how hard the implementation might be?

Lending some credence to the latter explanation, MSSI noted that with the implementation of a DBMS the users "generally have brought up predominantly new applications with only a very limited number of existing ones being converted."

In fact, it was generally one or more new applications that led managers to even consider a DBMS in the first place, the report said.

With the installation of a DBMS, particularly in the larger data centers, the development of a data base administration staff "was found to be required."

When this function is present and properly chartered with responsibility for coordination of all data base management activities, "there is a much higher level of satisfaction with and performance of the DBMS," the report continued.

On the average, approximately 25% to 30% of the surveyed installations' applications are being processed under DBMS. And, in most cases, one of each installation's most significant, larger applications was being processed on-line (under DBMS) with more on-line applications planned, MSSI said.

The survey indicated a move to more elaborate operating system environments as DBMS takes hold in an organization. While it was directed at all types of IBM DOS environments, the survey said "IBM's IMS and other sophisticated DBMS such as [MRI's] System 2000 were found . . . in increasing numbers in OS and OS/VS environments."

IBM's DL/1 and Cincom Systems' Total are the predominant DBMS installed within DOS and DOS/VS environments, the researchers added.

MSSI is at Suite 335, 7540 LBJ Freeway, Dallas, Texas 75251.

Divided Staff Conquering Workload

By Dr. Robert J. Bradley
Special to Computerworld

JEFFERSON CITY, Mo. – The Information Systems Division of the Missouri State Highway Patrol is currently developing and implementing comprehensive computer data base systems in three major functional areas: law enforcement, highway safety and public safety administration. These systems are all operated on a statewide computer network serviced by two IBM 370/155s and Comten 3650 communications controllers.

Since the initial development of a telecommunications network by the patrol in 1969, the level of services provided under this system has expanded dramatically. New projects have been undertaken with the purpose of providing for the evolving functional centralization of selected criminal justice agency services for the State of Missouri. During the period of 1972-1976, the annual computer system workload has increased as shown in Figure 1.

	1972	1973	1974	1975	1976 (Through August)
Transactions (Thousands)	4,608	13,236	21,712	23,906	18,745
Characters (Millions)	1,344	3,718	5,743	7,726	7,229
Jobs Processed	29,443	51,570	67,339	113,941	90,453

Figure 1

This work load increase can be attributed to the following:

- Maintaining statewide files on stolen vehicles, wanted persons, stolen property, highway road conditions, state weather conditions and message switching capabilities between terminal users in the state.
- Entry and retrieval of records from the National Crime Information Center in Washington, D.C., for state and local agencies.
- Message switching and retrieval of driver and motor vehicle records from the NLETS System (Phoenix) and the Missouri Department of Revenue System (driver and motor vehicle records).
- Collection and analysis of traffic accident reports from over 400 local police agencies.
- Collection processing, storage and retrieval of records for over 14 other state criminal justice agencies.

It very quickly became apparent that the software and applications systems developed in 1969 simply could not handle the workload of the '70s. After extensive and careful study, the Missouri Highway Patrol selected Cincom Systems' Total and Environ/1 as its data base management system and telecommunications monitor and they were installed in late 1973.

Even with the normal learning curve associated with any new technology and the orientation to new software capabilities, the patrol has been able to implement 13 major application systems by moving into the data base/data communications environment.

The new Environ/I and Total systems manage a network of 118 data base files. Daily terminal transactions to inquire and update these files average approximately 40,000 over a 12-hour period distributed as shown in Figure 2. Average internal processing time is approximately 1 second per transaction.

Departmental Reorganization

However, the patrol found with the advent of data base/data communications technology, a new departmental organizational structure would be necessary if application systems were to be developed and implemented on a timely basis. For that reason a data base section was created to manage all system files and data base related activity in addition to the traditional systems, programming and operations functions.

To achieve this goal, the data base section was divided into two functional groups: the data base design unit and the data base implementation unit.

The design unit is primarily concerned with converting systems specifications developed by systems analysts into technical data base design specifications. To achieve this objective, three functional activities were assigned to this unit:

- First, the system review process is

(Continued on Page 19)

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Ambitious Ambiguities

Outside Pressures Seen Impacting Selection of DBMS

By Don Leavitt
Of the CW Staff

MANCHESTER, England – In practice, the final decision to install a data base management system (DBMS) may be determined by factors which have little relevance to a reasoned approach, according to a senior consultant with the National Computing Centre here.

Writing in the September issue of the English magazine *Data Processing*, Brian Davis noted the DP manager making the DBMS decision has to face many pressures, including "a personal pressure to provide a panacea" for his organization..

Other distractions may be pressure from subordinates wanting to work with the latest techniques, pressure from higher up in the organization for management information and pressure from the parent company to "toe the party line," Davis added.

Although almost a postscript to an article in which Davis posed a list of questions and comments meant to provide a starting point when considering DBMS, these "outside" pressures often are the real reasons for an organization getting a DBMS, he said in a recent interview.

In light of that thought, the first of his questions takes on added significance: "What are the real reasons for proposing a data base system?" Listing some possible reasons, he warned "if there is no definite [reason] then the organization must make a conscious decision to invest" in the belief a DBMS will provide "the ultimate answer to the company's future DP problems."

Have the alternatives to adopting a data base approach really been explored? he asked next. And then, "What similar organizations have been successful in doing what is proposed and also what failures have there been, and for what reasons?"

Many organizations that are successful in the use of DBMS paid a great deal of attention to the experiences of others, Davis noted.

Beyond what happened at other Installations, he urged users to study the effect the proposed system might have on the organization and its management. The level at which the implementation of a DBMS needs to be controlled is directly related to the degree of system integration planned, he added.

Installing a DBMS may also require other software, Davis indicated as he discussed the possibility of a data dictionary.

Jumping back to concern for changes in the organization, he said the next question might be: "Will we need to establish a data base administrator?" The importance of the role of the DBA – and "he should be given the necessary authority" – is directly proportional to the degree of integration planned, Davis commented.

Another staffing concern is whether the necessary expertise exists within the company.

How will the users be affected by the implementation process? Davis' next worry, followed by a compound query that seems to cover many "housekeeping" details in a DBMS study: "How will reliability, integrity and privacy be maintained? What extra equipment will be necessary? What will be the availability and practicality of backup facilities? How will integrity and confidentiality be maintained?"

Texan 'Has Data Base, Will Travel'

DALLAS – If you ask Chuck Eisemann a question, the quiet Texan will give you a straightforward, brief answer. However, if you ask him for an opinion, you may get more than you bargained for. He packs a massive data base of opinions in his briefcase.

Eisemann, president of Dallas-Based International Resources & Applications, travels about the country performing employee attitude surveys for large corporations. His data base, a compilation of tens of thousands of previously expressed opinions, resides on the computers of Infonet, Computer Sciences Corp.'s international remote computing network. He taps into the data base to compare customer responses with the historical data – his "norm" – using a Texas Instruments 745 briefcase terminal.

"The purpose of the survey," explained Eisemann, "is to pinpoint favorable areas and problem areas within a company. The symptom, for example, may be high turnover, but the real problem may be a lack of recognition for a job well done. Now that's easy to fix, but very tough to detect without the survey."

Eisemann begins a typical survey by having the target group fill out an anonymous questionnaire containing 20 core questions, such as "I get recognition when I do good work – agree, no opinion, disagree." The core questions are based on M. Scott Myers' motivation maintenance theory. Up to 20 additional custom questions may be added to the questionnaire to zero in on clients' specific concerns.

He then enters the responses into an Infonet data file and uses several Fortran programs to produce instant comparison resports dtailing deviations from the norm. "A significant deviation in one of the categories usually isolates the problem," said Eisemann. "We then work with both management and labor to remedy the situation."

In a recent example, Eisemann presented management of a large mid-western firm with his survey findings broken down by department. Department managers and employees used the data to develop a safer working environment and cut back on wasted material, resulting in savings of more than $75,000 per year.

If the survey is relatively small, such as a specific group within a company, Eisemann collects the data in the morning and processes it during lunch. By the time the group returns from lunch, the reports are ready.

In the case of large surveys, Eisemann takes the raw data back to his office here and keys the raw data into Infonet for deferred execution. Once the responses are processed, he frequently uses CSC's graphic display software, Encore, to convert the tabular findings into charts.

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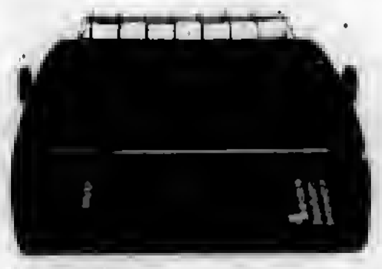
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Division of Duties Eases Work for DBMS Operations

(Continued from Page 17)

aimed at providing a more complete background of needs which may well influence technical design of the data base and associated access strategies. Most often these enhancements include additional detailed system procedures or workflow techniques, data base standards, data set modeling and establishment of educational requirements for user representatives.

- Secondly, final specifications of the data base are prepared. These specifications include functional data base design; data base structure and content; data base rules, limits and restrictions; and security consideration/features. Architectural activities occur in cycles of access path modeling and testing. This facilitates early modification of the data base network to ensure all functional and relational requirements are satisfied.
- Lastly, data base access paths and networks are tested for relationship efficiency with application code and test records.

The data base implementation unit is charged with the data base systems support and control functions.

- Data base systems support follows the design specifications in the creation of a physical data base. Associated activities include a logical data base definition (documentation of the physical data base) which is distributed to the appropriate system users. If needed, various application subschema definitions are also generated. In addition, test data bases are established and technical support provided to DP personnel.
- The data base systems control function addresses the continual monitoring and management of production data bases. Activities include all the mechanics of data base maintenance, i.e., backup, recovery, restart, file creation, loading/unloading and data base fine tuning.

Three Years' Work

Initially, the establishment of a separate data base section, with its own manager, was fundamental to the patrol's successful entry into the data base/data communications environment. The new systems (Figure 2) were designed, developed and implemented as on-line real-time systems in approximately three years with an average staff of six analysts and 13 programmers.

During this time period, the staff prepared 352,439 lines of code comprising 1,749 programs to process the 13 systems listed above.

With this massive development effort completed, new problems arose in regard to support and maintenance of the 118 files maintained as an on-line data base. To better coordinate these support requirements, the data base unit was then separated in the following manner:

- The data base implementation unit was transferred into a new technical support section which is responsible for the computer network, the teleprocessing monitor and the production data files.
- The data base design unit was merged into the systems and programming section which is responsible for the analysis, design and development of all application software. Lead systems analysts and programmers were given the responsibility and the duties of data base design as a part of their other design tasks. When an initial architecture of a system is prepared, the technical support section is consulted to review the technical considerations of networking, transaction processing and data base performance.

In summary, the initial organization of a separate data base unit was crucial to rapidly learn how to implement systems utilizing the Environ/1 and Total software products. As the unit became proficient and as new systems were placed in production, new needs developed which required a reorganization of staff capabilities.

At this time, the new development of on-line real-time systems has become a relatively standard task whereas the support and maintenance of multiple integrated systems becomes a more demanding task requiring a major concentration of staff expertise in the technical support section.

Bradley is director of the Division of Information Systems with the Missouri State Highway Patrol.

Systems	Files	Records	Average Daily Transactions
Attorney General Case Docketing	7	97,949	945
Budget Accounting	14	22,075	415
Commercial Motor Vehicle Carriers	8	130,408	1,192
Criminal History	7	481,008	2,005
Documentation Control	9	22,546	19
Drug Analysis	5	926	2
Juvenile Offender Case Records	5	21,248	286
Motor Vehicle Inspection	12	125,168	583
Network Security	8	644	166
Patrol Arrest Reporting	7	588,037	11,772
Probation/Parole Case Records	8	344,991	5,596
State Prison Population	18	206,745	4,113
Statewide Traffic Accident Records	10	1,359,855	12,056
	118	3,401,600	39,150

Figure 2

Monographs Published

WELLESLEY, Mass. – Listed as part of the Data Base Monograph series, *Data Base and Computer Systems Security* by John M. Carroll and *An Assessment of Current Data Base Trends* by Ronald G. Ross cost $15 each from Q.E.D. Information Sciences, Inc., P.O. Box 181, Wellesley, Mass. 02181.

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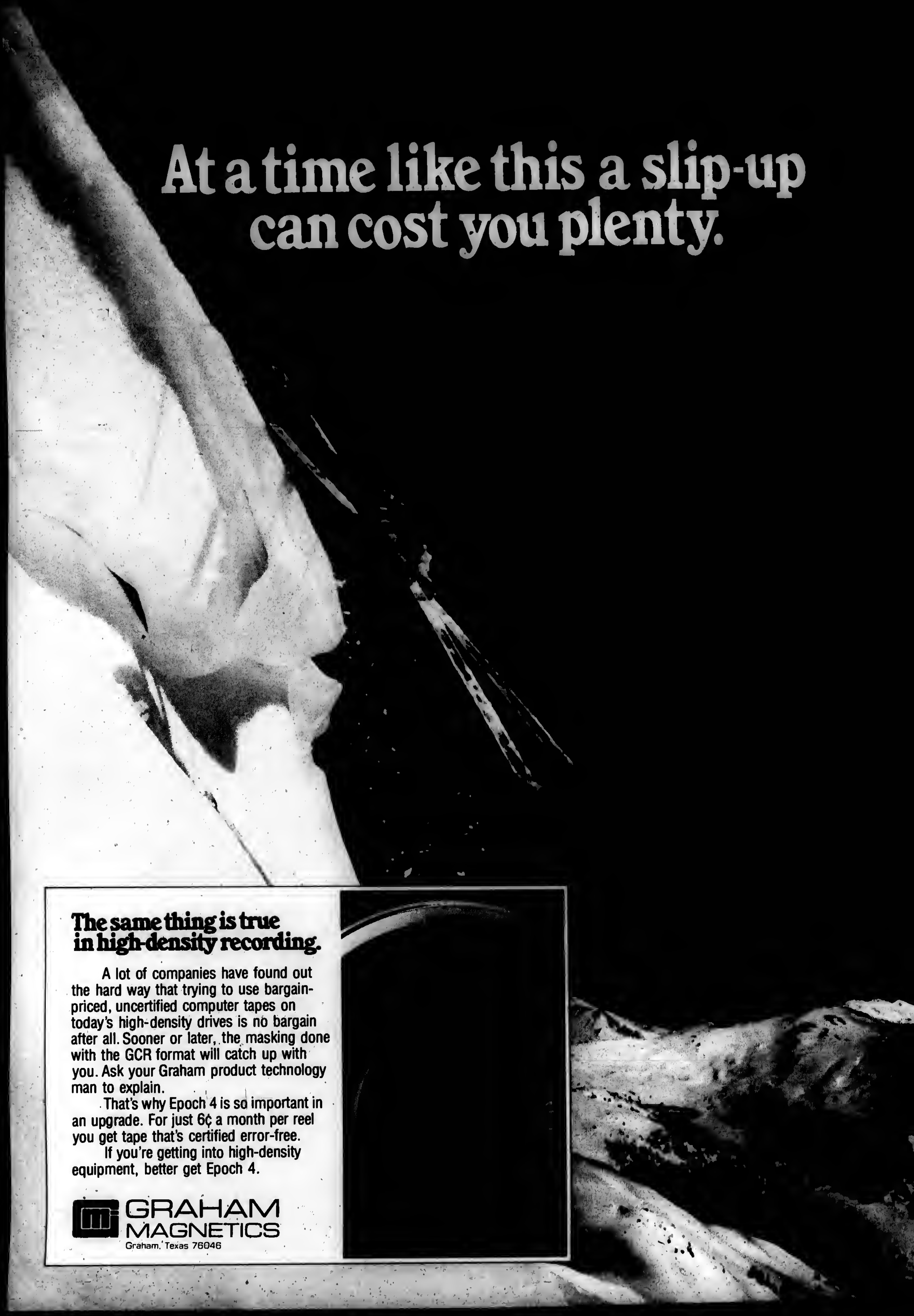

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DBMS Used as Base of Laboratory's Security System

By R.O. Tyler

Special to Computerworld

LOS ALAMOS, N.M. – The Los Alamos Scientific Laboratory here is operated by the University of California under contract with the U.S. Energy Research and Development Administration. Because of the nature of the laboratory's work, a high level of security has to be maintained.

One aspect of this security system controls and monitors access to the laboratory and its various sites by the several thousand employees and visitors who require admittance to perform their duties. As a by-product of the security measures, massive amounts of information relating to clearances, security education, badges and visits are compiled.

This information has to be stored in some accessible manner for several years. Early in 1975, a security operation designed around System 2000, the data base management system (DBMS) from MRI Systems Corp., was implemented to contain this data.

The primary goals of the security system were much the same as the goals for any modern DP information system: data integrity, reliability, timeliness of information, rapid retrieval of information from the data base and elimination of as much of the maintenance-programmer role as possible.

Making this even more of a normal DP application, there was a crunch on time, since implementation by the first of 1975 was highly desirable. Also, available manpower resources did not allow a massive programming effort to be used for this implementation.

What was unusual about the system was that all of the original goals were met with the available resources, including the implementation date. The system has been in operation for the past 22 months and it is doing the job for which it was designed.

Requirements Documented

The initial system analysis work required approximately one man-month. At the end of this time, the users' requirements had been documented.

Once this stage was completed, a test data base description was created and the test description was loaded with data. This phase of the project required two man-weeks, and no programs were required for the work – just the System 2000 natural language and a remote terminal. Once the test design was ready, a demonstration was given the requester.

At the end of the demonstration, limited training in simple retrieval language was given and the data base was released for evaluation. This phase took a day or two.

After a week of evaluation, the requester returned with several criticisms of the data base description. Appropriate modifications were made and the data base was then returned to the requester for further evaluation.

This evaluation and modification phase was repeated three or four times over a period of a month. The end result was a workable data base description which had been fully tested by the user.

In addition, there existed the full potential of the DBMS' natural language retrieval and update commands, its report writer feature and its backup system. In other words, all that remained was to load data into the data base and provide a method for batch updating.

One man-month was expended in the design, writing and testing of a Cobol edit/update program and two man-months were required for the design, writing and testing of a Cobol-PL/I program to perform the initial loading of information into the data base. After these projects were completed, a full system existed with some four and one-half man-months being expended.

Once the bare-bones system was implemented, several retrieval Cobol-PL/I programs were added to the system. These were master listing-type reports for special purposes.

In addition, several modifications were made to the data base description. These were to correct design errors and to meet new requirements.

To date, the DBMS has proven flexible enough to allow these additions and modifications without causing major upheavals for either the data base users or the DP department.

The security system was one of the laboratory's first data base efforts and there have been mistakes, as with any first attempt, but the DBMS itself has performed very well.

The users have been able to comprehend the retrieval language with no great problems. It is now possible to retrieve quickly such information as a list of all persons visiting the laboratory within a specific time span, those visiting for a specific reason, those issued a specific type of badge and those employed by a specific employer.

This type of information is needed almost on a daily basis, but prior to the implementation of the system it was nearly impossible to obtain. By allowing several terminals to be attached to the data base at various key locations in the laboratory, much of the information service aspect of the operation has been eliminated.

Limited on-line update, via terminal, in the DBMS' language has given the data base owner added flexibility in keeping the data base current and correct.

Audits of the system have proven that data reliability has been improved considerably. In addition, these audits can be performed without bringing the user's environment to a standstill. No more problems have been encountered with the batch updates to this system than similar updates in a more conventional system.

While the DBMS has some limitations, most can be circumvented without taking extreme measures.

Basically, in the final evaluation, the system works, the user is happy and the standards and rules of the DP production environment have not had to be totally scrapped.

Tyler is a senior programmer/analyst in the Administrative ADP Department at Los Alamos Scientific Laboratory.

Correction

The equation to determine the cost per data item cited by Morgan and Burke in "'Base' Approach Wrong for Some Data" (see Page S/9) should read:

$$Md = \frac{\text{Manpower Costs} + \text{Computer Costs}}{\text{Data Items}}$$

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New York Hospital Picks DBMS

Cost of Systems People, Ills of Old System Cured

BRONX, N.Y. – The high cost of systems personnel was a major issue in the selection of a data base management system (DBMS) by a major hospital here.

"After checking with a number of existing users, we discovered that with IMS we would need a minimum of two systems programmers. With IDMS, on the other hand, I'm able to perform all systems support functions myself using only 10% of my time as DBA." That's how William A. Walker, data base administrator for Montefiore Hospital, summarized the selection of the Integrated Database Management System (IDMS) from Cullinane Corp.

When the decision was made to replace an outmoded, ineffective information system with a data base management facility, the hospital's DP project team determined implementation must occur slowly, "from the outside in." Adopting this gradual approach, the planners decided the hospital's Medical Group was an ideal place to begin the conversion to DBMS.

The Medical Group is an outpatient, ambulatory care facility staffed by private physicians and specialists. Occupying its own building, the group has an autonomous staff of registrars and accounting personnel. Thus, it forms a peripheral and somewhat segregated data collection area.

With a patient clientele numbering almost 40,000, this outpatient facility was chosen as the focal point of a conversion process that will gradually move inward toward the hospital's accounting and general ledger system.

The DP project team began its feasibility study by tracing the hospital's overall data flow and projecting a gross timetable (by quarters) for implementation of an information system that would operate from a single, hospitalwide data base.

Previous Process

Under the old registration system, according to Walker, registrars completed all forms based upon information supplied by the patient at the time of admission. The forms were keypunched and output to tape each week to update the registration master file. Then printouts of the updated information were generated and returned to the registrars for a validity check.

Bills were generated from the master file and sent to the appropriate party.

Finally, patient information forms, containing data repeated from the registration forms, were prepared manually and sent through the same keypunch-tape-print cycle.

Timely data access was impossible, Walker noted. Even routine questions such as "Has this patient been treated here before?" Or "What is his insurance company?" necessitated numerous phone calls and time-consuming cross-checks throughout various hospital departments.

Report generation was slow, he added. Since the batch-oriented card-to-tape system generated bills only once a month, the hospital's cash flow deteriorated. Weekly billing was needed as well as the ability to interface directly with Medicare and Medicaid agencies. The old system was simply incapable of providing timely output processing, Walker said.

Error handling was inefficient and inaccurate or missing registration data would often be discovered only during the manual verification cycle or the billing process.

There was also a high degree of data redundancy. Medical Group patients often were admitted later as inpatients, and a complete new set of registration data, much of it repetitive, would be collected for the patient.

All of this meant Montefiore's DP department spent most of its time putting out users' fires and clearing up confusions resulting from each department's attempt to control its own data. Also, a closely watched, limited budget posed serious hindrances to change.

Team Objectives

The DP project team determined that any system implemented must eliminate data redundancy as far as possible by providing immediate access to all registration and accounting data for an individual patient. The system should also provide instantaneous data retrieval and update capabilities from within the user departments and generate timely reports for both users and DP personnel.

After a two-year planning period, the project team decided an on-line data base management system would best meet the hospital's overall information needs. During the selection process, Walker and the project members examined all of the major data base systems. Montefiore chose IDMS because, as Walker phrased it, "it fit most closely the hospital's data base design criteria."

Support, however, was the real deciding factor in the selection. As part of the decision-making process, Walker telephoned several existing IDMS users. According to his findings, "Cullinane's staff was known to respond quickly whenever problems arose."

Montefiore installed IDMS in April 1975 and the first production program, the Medical Group Patient Registration application, went live in November 1975.

Under the new system, all registration data is entered through 10 IBM 3270s tied to the hospital's 370/145. All transactions are entered via CICS, which performs all message-switching tasks and channels data base requests to IDMS.

Walker traced a typical transaction through the system:

- The user signs on and is presented with a "menu" with four options: new patient registration, data retrieval, registration update or "face sheet" output.
- The system projects onto the CRT a facsimile of a registration form that is either blank, partially complete or totally complete, depending on the function chosen.
- The patient's name and address, Social Security number, Medical Group accounting number, date of birth, responsible party, emergency contact and insurance information is keyed in as need-

(Continued on Page 23)

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By Don Trinite, EDP Audit Manager
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Small Test Bed Eases Design of IMS Applications

By Gary M. Gumbiner

Special to Computerworld

CHICAGO – When designing a data base system, it is often advantageous to be able to create small test data bases for training and application program testing purposes. However, test data bases must be created quickly, and when the inevitable structural changes occur, the test data bases must be flexible enough to allow for their implementation.

Our experiences at the Chicago Transit Authority in creating small IMS/VS test data bases for the Bus Utilization System (BUS) project has led to the following approach.

Two basic steps are required to generate initial test data bases:

1) For each data base to be loaded an OS file of variable length records must be generated. Each record represents a segment to be inserted into the test data bases. The records must occur in hierarchical sequence required by the corresponding data base. The records contain the segment name, followed by the data portion of the segment to be loaded.

2) The following tasks must be performed:

- Allocate the required Vsam clusters. (Assume test data bases will use the Virtual Storage Access Method.)
- Invoke the Utility Control Facility (UCF) to load the data bases, resolve any logical relations and generate secondary indices.
- Invoke a program to list the data bases just loaded (e.g., DFSDDLTO).
- Execute the IDCAMS PRINT command to provide a dump of the data bases to verify that pointers are allocated and filled as intended.

The first step determines the actual content of the data bases. Any standard OS test file generator can be used. The transit authority selected IBM's IEBDG as the most readily available.

A great deal of care and time is required to lay out the test files properly. The following guidelines are recommended:

- Very few records should occur in each data base.
- Logical relationships must all resolve properly.
- Most common situations should occur, but it is not necessary to put in all conditions. It is easier to create simple test data bases, then alter them with a user program to reflect any unusual conditions.

Any mechanism chosen to generate the OS files must allow for easy addition of fields to a segment, alteration of field lengths and addition of segments.

The following general points should be noted about the second step:

- The IDCAMS step should delete old Vsam clusters and then define new Vsam clusters.
- Work files used by UCF sometimes must be referenced by more than one DDNAME. In that case, the files must be allocated before the UCF step (e.g., with IEFBR14).
- The common field values required on logical relationships must be checked carefully. If they are invalid (e.g., no logical parent exists for a logical child), UCF will list the invalid conditions as it detects them.

Assuming one master set of data bases has been created, test data bases for users can easily be created by invoking IDCAMS to deallocate/allocate all required Vsam clusters and use the REPRO command to create copies of the test data bases.

It should be noted that the above IDCAMS step should be executed as a separate job and not as part of the job which actually creates the test data bases.

Also, it is assumed all required DBDs and PSBs have been assembled correctly.

Gumbiner is a senior applications analyst with the Chicago Transit Authority.

DBMS Cures Ills Of Registration

(Continued from Page 22)

ed, edited automatically, transferred to the CPU and, once all data is correct, written to the data base.

- As each transaction is written to the data base, the Central Access Method Program (Camp) writes all new or changed data to a journal tape for backup security. Thus, if an on-line application program abends, Camp will restore the data base using the contents of the journal tape.
- Two copies of the new or updated registration form are automatically printed in the registration and medical records offices using Cullinane's Culprit output processor.

For the inquiry and update functions, data is retrieved by entering the patient's Social Security number, Medical Group accounting number or name. For retrieval by name, a phonetic look-up is permitted.

Four screens are required to display all information concerning an individual patient.

Purchasing History

In addition to the Medical Group registration application, Montefiore has recently implemented a purchasing history application under IDMS. Described by Walker as a "stopgap" measure, the application primarily involves data retrieval from a purchase order data set with minimal updates.

The purchasing department generates reports on all outstanding purchase orders as well as ad hoc reports on the contents of specific orders.

Meanwhile, work has already begun on the conversion of the Medical Group accounting and billing system to IDMS. This project should be completed by mid-1977, Walker noted. Also, the hospital is currently looking into the possibility of converting to IDMS an IBM inpatient accounting package written in DL/I.

Elimination of data redundancy, especially in the area of repetitive names and addresses for patients, emergency contacts and responsible parties accounts for most of the disk storage savings Walker expected.

In addition, a substantial CPU savings has been realized. According to Walker, "Our live system has not come down at all due to a problem caused by IDMS." In general, the implementation of an on-line data base system has meant fully edited data is written directly to the data base, data is made immediately available for billing, inquiry and update purposes, and reports are out on time.

But Walker also pointed out unexpected savings. "Using IDMS, I've noticed for example a marked increase in programmer productivity."

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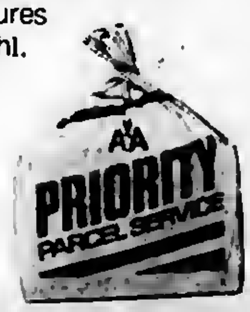

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Users Find Good Payoff From In-House DBMS Training

The Human Connection

By Don Leavitt
Of the CW Staff

Careful evaluation of all the alternatives is one of the standards – indeed, very nearly a cliche – of a good and effective move into data base management systems (DBMS). But such a careful selection process is not always part of a good and effective move into training in support of DBMS.

In at least two cases recently, user organizations have chosen a training regimen conducted by a firm completely independent of the DBMS vendor. And they made their choices based on considerations completely apart from any attempt at a formal evaluation process of possible suppliers.

Sikorsky Helicopters of Stratford, Conn., asked Data Base Management, Inc. (DBMI) to run some classes oriented to IBM's IMS, primarily on the basis of what DBMI had done previously for Pratt & Whitney, which like Sikorsky is a division of United Technologies, and several other installations in Connecticut.

In Washington, D.C., Allegheny Airlines first encountered the same trainers through classes presented by DBMI under the auspices of an independent group of users attempting to work with IMS but finding themselves with a number of common problems.

That class and work DBMI has done specifically for Allegheny since then has convinced Allegheny's manager of systems development, Nick Bredimus, that "DBMI has a real handle on IMS, more so than IBM if you want my honest opinion."

The airline has had IMS installed since 1971 and though it had one major system running – "It was a real-time system for cataloging and locating spare parts" – it wasn't until mid-1975 that it began to look at other possibilities and the need to beef up its staff, Bredimus said.

Generally the new staffers had real-time experience but no exposure to IMS. Allegheny and Bredimus became involved with the Washington-area IMS users group and, about a year ago, DBMI offered to put on a class for the group.

The first course was on IMS's Message Format Services; it lasted three days, included 22 students from all the installations in the group and cost only $100/student. Bredimus admitted recently he was impressed.

He had been equally impressed, he indicated, with the second group-sponsored DBMI course, though it ended abortively. It was supposed to be on advanced data base design but, after the first day and a half, both the instructors and the students realized the content was too elementary for the particular group.

DBMI stopped the class right there. "It didn't charge anyone anything and went back to rewrite the course plan. I thought it was very, very good to get that reaction," the Allegheny manager remarked.

Next Bredimus went directly to DBMI and asked the company to prepare a course especially for Allegheny. He knew what he wanted: a course that would emphasize the IMS features Allegheny had found useful and which Bredimus wanted to standardize as well as training that would help in planning for the conversion to IMS/VS Bredimus knew was coming.

The tailored course, which took five days, was given to a group of 18 or 19 Allegheny employees. It cost only $500 more than DBMI's standard course so the added cost per student day of the special training was minimal, Bredimus said, adding he expects to use the company again as the need arises.

Independent's Prices Lower

Back in Connecticut, Sikorsky's supervisor of software, Stewart Stern, had a slightly different view of the economics of using DBMI's trainers in-house. Put very simply, the cost of sending people to IBM's courses in New York or Boston is greater than the cost of in-house training as soon as three or more students are involved, he claimed.

IBM offered to bring its courses to Sikorsky, he said, "but they weren't as attractively priced as DBMI." Like Allegheny, Sikorsky uses audio/visual courses for training when its seems appropriate, but none were available in multimedia form at the time. Stern saw the need for DBMS courses.

It was the experience of the other DBMI clients, however, that really moved Sikorsky to opt for the independent's IMS training in-house, the supervisor said. Since then, the company has had the trainers in for courses on data base and data communications programs or on data base design and IMS's Message Format Services, he added.

Stern estimated Sikorsky has a professional DP staff made up of 55 programmers and analysts, another three in data base support and five more in the software support group. Overall, 15 to 20 people have been through each of the DBMI courses, he said.

Looking at Other Options

He said he is "still addressing" the problem of what to do now. There is followup work needed by some who have been through the courses, as well as a need to train some other people.

"But there is no need to have everyone trained in all aspects of data base and data communications," he said emphatically. In addition to DBMI, there are new options available, he said, citing the audio/visual courses now on the market. IBM's Interactive Training System, also on the market, is, in fact, an IMS application, he pointed out.

Stern will be using those options, he said, but he is still happy with DBMI's work, noting – for instance – that DBMI has been hired by Sikorsky to do some "live" consulting work on a large data communications application, as well as any training that may be needed.

"These guys have the expertise to do real work as well as the knowledge and the manpower to do the training," Stern said.

DBMI is headquartered at Vernon Professional Circle, Vernon, Conn.

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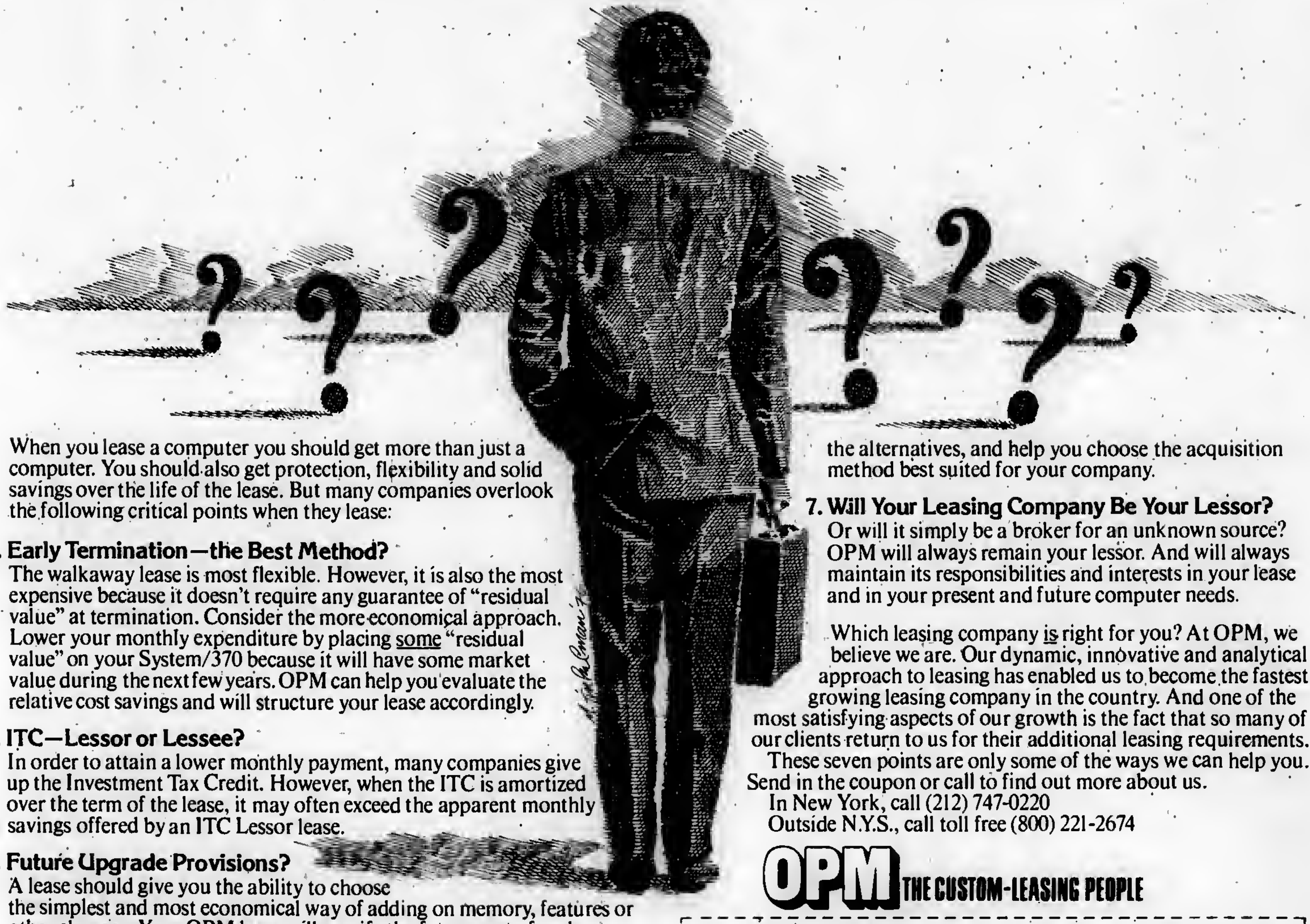
S/370 Computer Leasing: 7 Ways to Avoid Costly Mistakes



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Center Sidesteps Cost Hike With ALDs, Leased Lines

By John P. Hebert

Of the CW Staff

SUNNYVALE, Calif. – Faced with a telephone company tariff change that would have boosted its monthly bill for transmission lines as much as $5,000, a large user – and vendor – of computer products here found an interim solution which resulted in increased communications capabilities for the same cost increase.

Andy Failla explains the various functions of rows of Prentice Corp. asynchronous line drivers in the National Semiconductor Corp. data center.

The solution was asynchronous line drivers (ALD) and conversion from dial-up to leased lines, according to Andy Failla, manager of National Semiconductor Corp.'s Corporate Data Center.

The data center is a crucial division of National Semi, Failla said. Its DP capabilities maintain the present quality of the manufacturer's integrated microprocessor and microcomputer product lines and are used for administrative DP, he explained.

Price increases associated with Bell Telephone's 43401 tariff specification for dial-up lines would have cost the center $3,000 to $5,000 more each month to transmit program development data for processing to the center from National Semi's users across the country, Failla said, adding he is concerned with "making the data center work well at the smallest possible cost to the company."

Utilization of the ALDs has increased asynchronous transmission rates to 2,400 bit/sec and allowed full utilization of the terminals, CPU ports and transmission lines supporting National Semi's data communications applications, Failla noted.

The Prentice Corp. line drivers have also increased line efficiency by feeding National Semi's Product Status System (PSS) data directly into a multiplexer channel and, from there, into the data center's 256K Hewlett-Packard Co. (HP) 3000-II mainframe dedicated to the PSS task. The HP CPU has a 47M-byte disk, one 1,600 bit/in. tape drive and an HP 2640A operator console.

"PSS is the heartbeat of semiconductor manufacturing activities at National," Failla said, because it monitors the journey of the company's semiconductors through the factory life cycle.

Formerly a manual system, it was first implemented on service bureau computers in 1969.

Cost Trade-Offs

When Pacific Telephone & Telegraph announced it would go to the Single Message Rate Timing (SMRT) tariff and charge for connect time in addition to the basic monthly cost of the lines, Failla decided it would be necessary to make cost trade-offs between type of lines, their cost and equipment "hanging off the lines" to make the data center run as efficiently and inexpensively as possible.

Plans were made and all of the dedicated and dial-up lines were converted to Bell 3002 leased lines, he said.

The one-time costs involved in converting to the leased lines and purchasing the Prentice line drivers were high, Failla said, but corporate management was convinced it would benefit from the money spent.

The 3002 lines have enabled National Semi to utilize the Prentice line drivers, devices with greater speed capabilities at a lower cost than renting standard modems, according to Failla.

The firm is now using 204 ALDs in a point-to-point, time-sharing environment to link Lear Siegler, Inc. LSI 80M1, -2 and -3 terminals "down the road" at corporate headquarters – even though the data center was scheduled to go to a synchronous operation and had Prentice P201 modems on lease for three years, he said.

National Semi considers PSS so critical to its operation that it has a second HP 3000-II acting as backup to the on-line 3000 dedicated to PSS. The second system, according to Failla, is used for material requirements planning and administrative and manufacturing DP, although a priority interrupt provides for switching to support the PSS application if the primary 3000 goes down.

All of the Prentice equipment is modular; if there is a problem with either type of component in the PSS or other applications, National Semi employees – in the field or at the data center – can immediately plug in spare components, Failla said.

In fact, "all things likely to fail on the systems, other than the Bell lines, are modular and can be easily replaced," he said.

There is no need for the diagnostics, Failla said, adding that if an ALD is not working, he sends it back to Prentice.

(Continued on Page 28)

FCC to Hear Industry Views on Inquiry

WASHINGTON, D.C. – The computer industry will be given an opportunity to present its views to the Federal Communications Commission (FCC) at a conference scheduled for Nov. 8 and 9 here.

The two-day meeting is being organized by the American Federation of Information Processing Societies (Afips) for the FCC to provide technological information relating to the Computer Inquiry recently reopened by the commission. One of the main areas of interest in the inquiry is the relationship between computers and communications [CW, Aug. 9].

Five speakers selected by Afips will present papers on various aspects of the computer communications technology. The objective of the conference is tp provide the FCC with a description of current and anticipated developments in computer communications which are likely to affect FCC regulatory responsibilities, according to Keith Uncapher, chairman of the Afips Washington Activities Committee.

A review of current demand for services, current technological capabilities and regulatory problems will be presented by Lynn Hopewell, chairman of the IEEE Computer Society's Computer Communications Technical Committee and senior member of the technical staff at Computer Sciences Corp.

A review of current marketplace needs, pricing trends and local distribution problems will be presented by Alex Curran, president of Bell Northern Research, Inc.

A survey of new research in computer communications, particularly those areas of development which may impact regulatory policy, will be presented by Vinton Cerf, assistant professor of electrical engineering at Stanford University.

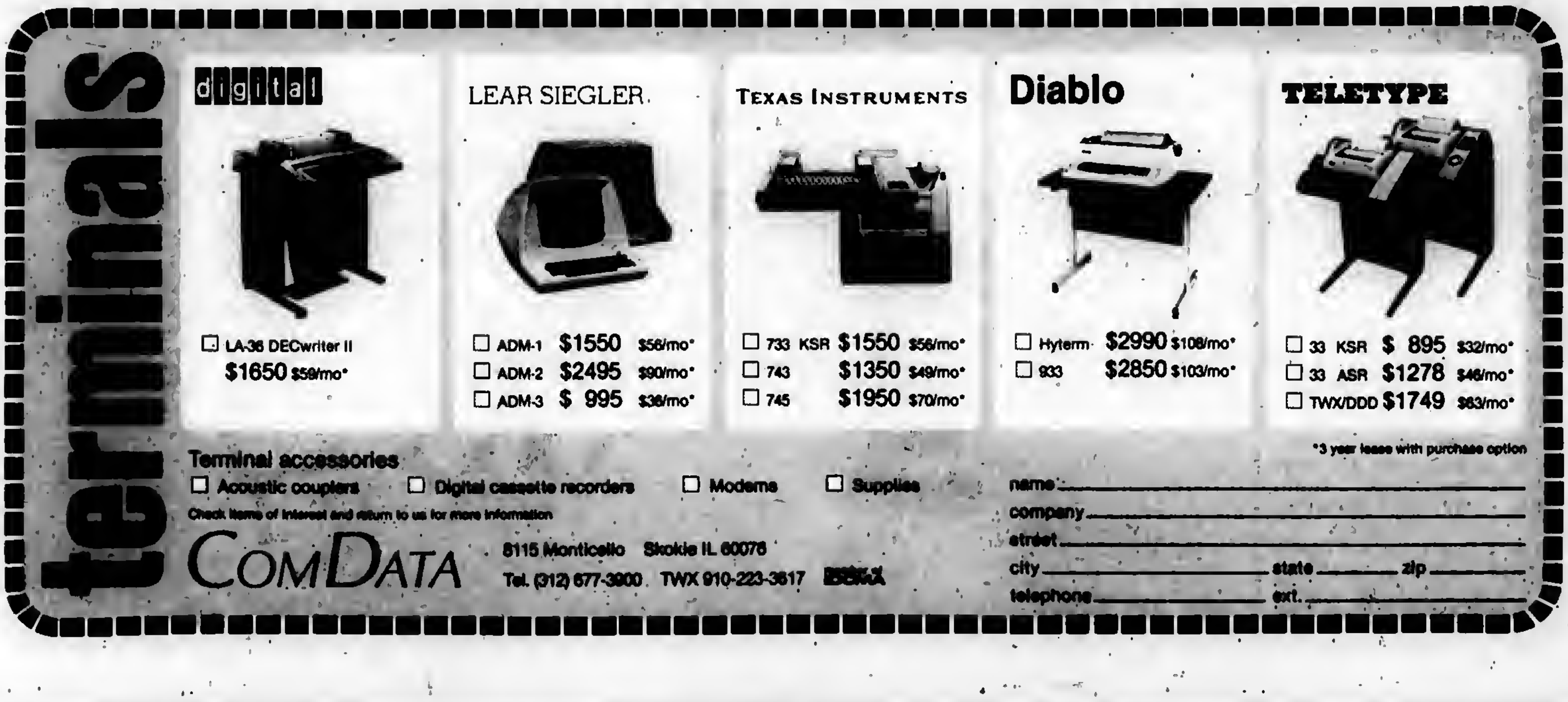
A discussion of institutional constraints and other factors which inhibit the growth of new computer communications technologies will be presented by Donald Dunn, professor of engineering economics at Stanford.

A discussion of possible future development of computer communications capability in the U.S. and causal relationships with FCC policies will be presented by Uncapher, director of the Information Sciences Institute at the University of Southern California.

The presentations will be given to the FCC commissioners and staff. The conference will be open to the public, but participation will be limited to the Afips representatives and FCC personnel.

Users and others interested in suggesting topics that should be included in the presentations should contact Phillip Nyborg, Afips, Suite 420, 2100 L St. N.W., Washington, D.C. 20037.

The conference will be held at the FCC offices, 1919 M St. N.W. The sessions will begin at 9:30 a.m. in Room 856.



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Leased Lines Part of Solution To Rate Increase

(Continued from Page 27)

A "very key man at Prentice," Failla noted, was its worldwide service manager. "He helped to get the PSS system up on the HP 3000 from the [former] IBM 360/65 and got things done.

"I believe in using all the resources of a vendor that I am able to use," he added.

The use of the Prentice ALDs is only a measure to side-step the phone company's rate increase, but the devices will be used in the future, Failla said. He is eventually planning to get into port contention, which he sees as "the final answer" to problems and costs in data communications for National Semi's applications.

The ALDs "will lend themselves very well" to the company's movement toward port contention because the data center will have no surplus gear and therefore no major reworking of present equipment will be required, Failla said.

Rather, there will be additions to the existing facilities of the Corporate Data Center, he said. "We're not locked in on a one-for-one basis – the system has been carefully designed to avoid that," he stressed.

Versitron Nodem Replaces Modem

WASHINGTON, D.C. – Versitron, Inc. has introduced the Nodem modem eliminator to replace modems in local distribution applications.

Nodem has an EIA interface and is transparent to the terminal, according to a Versitron spokesman.

The modem eliminator is capable of full-duplex operation over a four-wire metallic cable at synchronous and asynchronous data rates up to 19.2 kbit/sec over a distance of about one mile, he added.

It can be used as a single-channel device or integrated with Versitron's Cable Driver/Receiver system for multiterminal installation, the company said, adding provision has been made for polled operation.

The Nodem modem eliminator is priced at $544. Versitron is at 6310 Chillum Place N.W., Washington, D.C. 20011.

Service Unit Offered

SAN CARLOS, Calif. – GTE Lenkurt, Inc. has developed the L550A channel service unit to provide interface facilities to its digital data system network at the local loop level.

The L550A is said to condition the data terminal equipment signal for transmission over private-line metallic circuits to the digital system's central office.

The unit provides level adjustment and equalization as well as circuit protection.

Four arrangements are available to match the existing 2,400-, 4,800- and 9,600 bit/sec and 56 kbit/sec line speeds.

A GTE spokesman was unable to quote prices for the L550A. GTE is located at 1105 County Road, San Carlos, Calif. 94070.

Data Center Experiences Many Changes

SUNNYVALE, Calif. – The conversion from dial-up lines to leased lines to support National Semiconductor Corp.'s remote users working on program development data was not the only change the firm's Corporate Data Center experienced recently.

The center, about half a mile down the road from National's corporate headquarters in Santa Clara, also supports National Semi's corporate users of the Product Status System (PSS) for manufacturing control, according to Andy Failla, data center manager.

The foundation of PSS, which Failla called the "heartbeat" of National Semi's product control, was switched from an IBM 360/65 to a Hewlett-Packard HP 3000-II CPU earlier this month.

The center itself had – until last March – been a time-sharing division of Greyhound Computer Corp. which National Semi used for much of its manufacturing control DP.

When National Semi acquired the center, it gained both the IBM 360/65 and the Greyhound staff.

An IBM 370/158 will be phased in soon to replace the 65, assume the corporation's future processing applications and take on some engineering work presently run at service bureaus, he said.

The Model 158 will also support 30 to 40 local and remote corporate users editing and reassembling data and examining system output; in addition, it will support remote job entry and other data entry functions, he said.

All of these functions will be performed on Optimum Systems, Inc.'s (OSI) Wylbur software through Prentice Corp. asynchronous line adapters and Bell 3002 leased lines at 1,200 bit/sec feeding into an IBM 3705 communications control unit.

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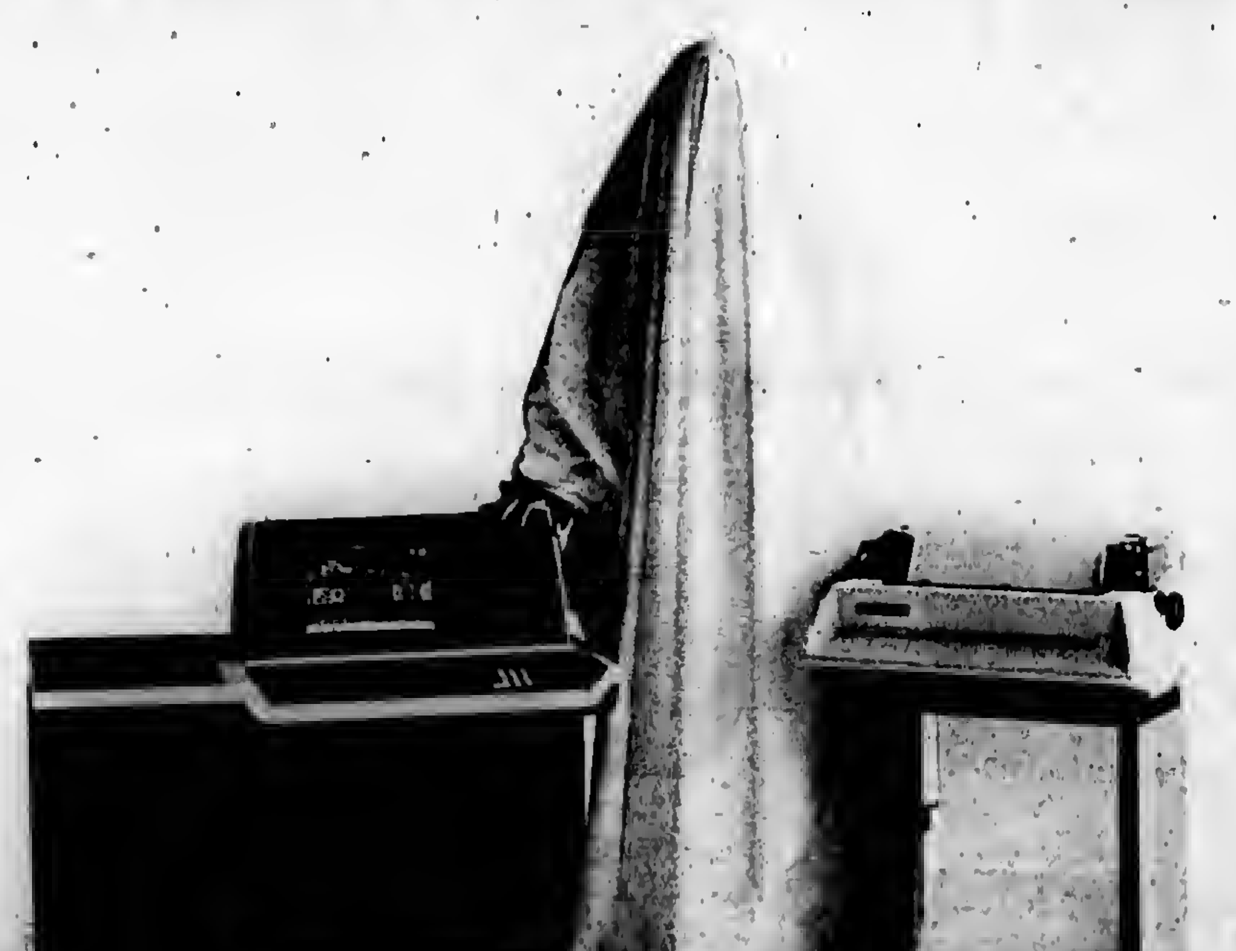

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Adds Enhances System 70

HAUPPAUGE, N.Y. – Applied Digital Data Systems, Inc. (Adds) has made its recently introduced System 70 intelligent terminal compatible with teletypewriters.

The teletypewriter communications protocol is said to allow System 70 terminals to operate in page, message and conversational modes. It is utilized by loading a 6-sec program.

With the additional protocol, the intelligent terminal can act as an upgraded teletypewriter replacement, transmit data at speeds up to 9,600 bit/sec, edit data locally, store data on diskettes and display upper and lower case characters on the 1,920-character CRT screen, she said.

A System 70 terminal with one diskette drive and either IBM 3780 terminal protocol or teletypewriter-compatible protocol costs $7,295, she said.

With both protocols, the terminal is priced $50 higher, she added from 100 Marcus Blvd., Hauppauge, N.Y. 11787.

HP Introduces the First in a Series Of Small Numeric Data Entry Terminals

PALO ALTO, Calif. – Hewlett-Packard Co. (HP) has ventured into different computer terminal territory with the introduction of the first in a series of numeric data entry terminals.

The HP 3070A and HP 3071A terminals are small desktop units designed for use in industrial and commercial applications by operators who have little or no experience using computer equipment, according to an HP spokesman.

The HP 3070A can be utilized as a complementary device to HP 2100 and 21MX mainframes, although it was primarily designed for operation with the recently introduced HP 1000 system [CW, Oct. 4].

The 3071A numeric terminal can be utilized with computers made by most other manufacturers because it has an RS-232C interface, the spokesman noted.

Both models reportedly can be tailored to users' applications; they have numeric-only keypads for data entry and 16-digit LED indicators that can be labeled to match user-prepared computer programs, according to the spokesman.

Hard-Wired Connections

The HP 3070A is said to be an addition to HP systems used in manufacturing and test and measurement applications.

It communicates to the CPUs through hard-wired connections at speeds of 13- to 230 char./sec depending on the number of terminals on a multidrop link, the spokesman noted.

As many as 63 of the 3070A terminals can be connected to an HP 1000 via a single twisted-pair cable, he claimed. They are capable of automatic error detection and automatic error retransmission through the addition of an optional $1,200 interface to the HP CPU, he said.

The terminal can also be used to link up to 13 HP interface bus-compatible instruments to the HP 1000. The interface enables the CPU to control instruments witin 1.24 miles compared with 60 feet when utilizing standard interfacing methods, he stated.

The HP 3071A is capable of transmission speeds up to 300 bit/sec, he added.

Prices for the HP 3070A and 3071A are $1,470 and $1,285, respectively. Deliveries will begin in November from 1501 Page Mill Road, Palo Alto, Calif. 94304.

Miscoe Introduces Writer Interface

MISSISSAUGA, Ont. – The Miscoe Manufacturing Ltd. Lazzz MCI communications interface was designed to interface the Digital Equipment Corp. LA180 Decwriter to parallel or serial data sources such as CRT terminals or modems.

The interface contains a first-in first-out (Fifo) buffer with 64 to 512 characters; the buffer is used to store an entire message with a blocked-data option, according to the company.

A message can be sent to the printer by the data source after the received message has been verified as error-free, the company said.

The Lazzz interface is available in four versions: basic parallel, basic serial, basic serial with reverse channel response and blocked serial with ACK/NAK response, it added.

The parallel version can accept data into the buffer at up to 9,600 bit/sec, while the serial versions are switch-selectable for transmission speeds up to 1,800 bit/sec and for parity and number of stop bits, according to the firm.

The interface includes an interconnect cable and is said to mount on existing terminal posts.

Lazzz MCI prices start at $400, Miscoe said from 6358 Viscount Road, Mississauga, Ont. L4V 1H3.

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Sanders CRT Unit Features Programmable Micros

NASHUA, N.H. – Sanders Associates, Inc. has introduced the Graphics 7, an intelligent, interactive graphic display system featuring two programmable microprocessors.

The terminal system is compatible with most computer systems via an RS-232C interface or a high-speed parallel interface and has all the graphic capabilities of Sanders' larger systems, the vendor claimed.

Interactive operations are preprogrammed on the system, Sanders said.

When used with Sanders' optional Fortran Graphic Support Software (GSS) package, the host system allows the user to begin applications programming immediately by freeing the programmer from the task of supporting the terminal, according to a Sanders spokesman.

The Graphic 7 also includes a one-button initiate feature allowing the system to ready itself for operation and allowing the operator to communicate immediately with the terminal or host computer, he added.

Two Micros

The heart of the system is the terminal controller which includes two microprocessors, a display processor and a graphics controller, the company said.

The display processor is a general-purpose unit and operates with 16-bit words or 8-bit bytes; it has general-purpose registers and an 8K 16-bit read/write memory expandable in 8K increments to 24K, the spokesman explained.

The graphic controller is a 16-bit parallel microprocessor with 40 display instructions, 13 display registers and four general registers, providing refresh rates of 60-, 40- and 30 Hz.

A 4K by 16-bit read-only memory (ROM) in the terminal controller contains the control program that handles communications between the terminal and the host CPU, controls the data entry devices, manages the display image refresh and performs other functions usually performed by the host computer, the company said.

The system has two interface options – a 16-bit parallel interface and the RS-232C interface. RS-232 communications are either synchronous or asynchronous at standard speeds up to 9,600 bit/sec, although speeds up to 50 kbit/sec are available for local operation, according to the firm.

The terminal features an interactive graphics capability to and from the host CPU based on only six fundamental messages; this simplifies operations for first-time users, the spokesman claimed.

The Graphic 7 includes a detachable keyboard with 54 alphanumeric keys and 32 function keys; a 64-key alphanumeric keyboard with 32 lighted function keys is offered as optional equipment.

CRT characteristics include a directed beam, or random-scan, display technique with cursor stroke character generation defined by Ascii code for continuous linear vector display. Vectors can be drawn to absolute or relative modes.

Four CRT character sizes are available, he noted, and 90° rotation is offered as standard; there is an optional device for rotation of displayed data to any angle.

A basic Graphic 7 system costs $32,800 and includes the standard keyboard, the terminal controller, CRT screen and one interface.

All of the systems hardware components are modular, the spokesman noted from Daniel Webster Highway South, Nashua, N.H. 03060.

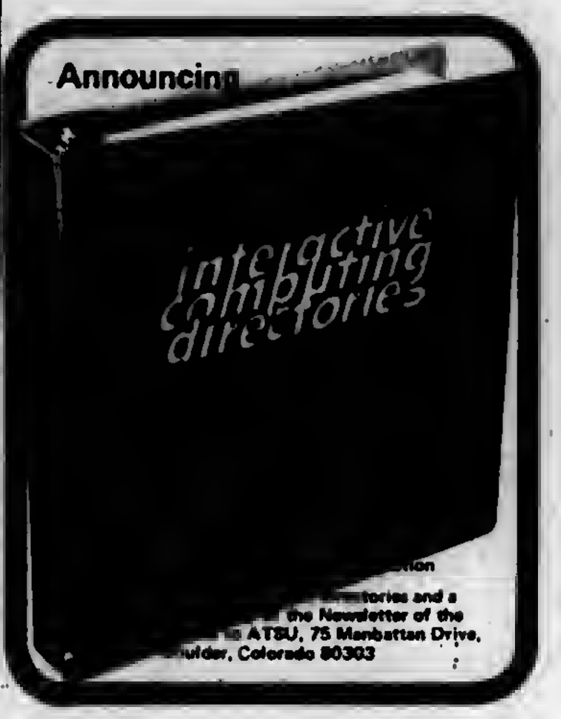
Multitech Adds Coupler

MINNEAPOLIS – The Model FM30 is the latest member of the Multitech Systems, Inc. line of acoustic couplers and modems.

The FM30 was designed to operate at rates up to 300 bit/sec in the originate mode.

Full- or half-duplex operation is provided; the unit has both RS-232C and 20mA current loop interface capability, Multitech said.

Features include a crystal-controlled transmitter, active filtering and digital detection in the receiver, the company noted. The price for the FM30 is $270, a spokesman said from 3406 University Ave. S.E., Minneapolis, Minn. 55414.



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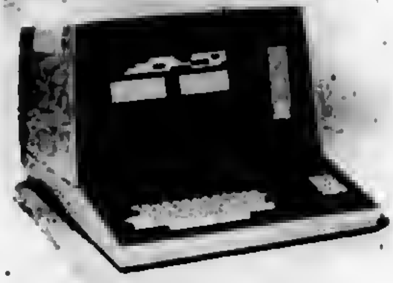

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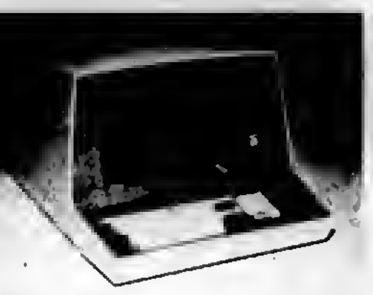

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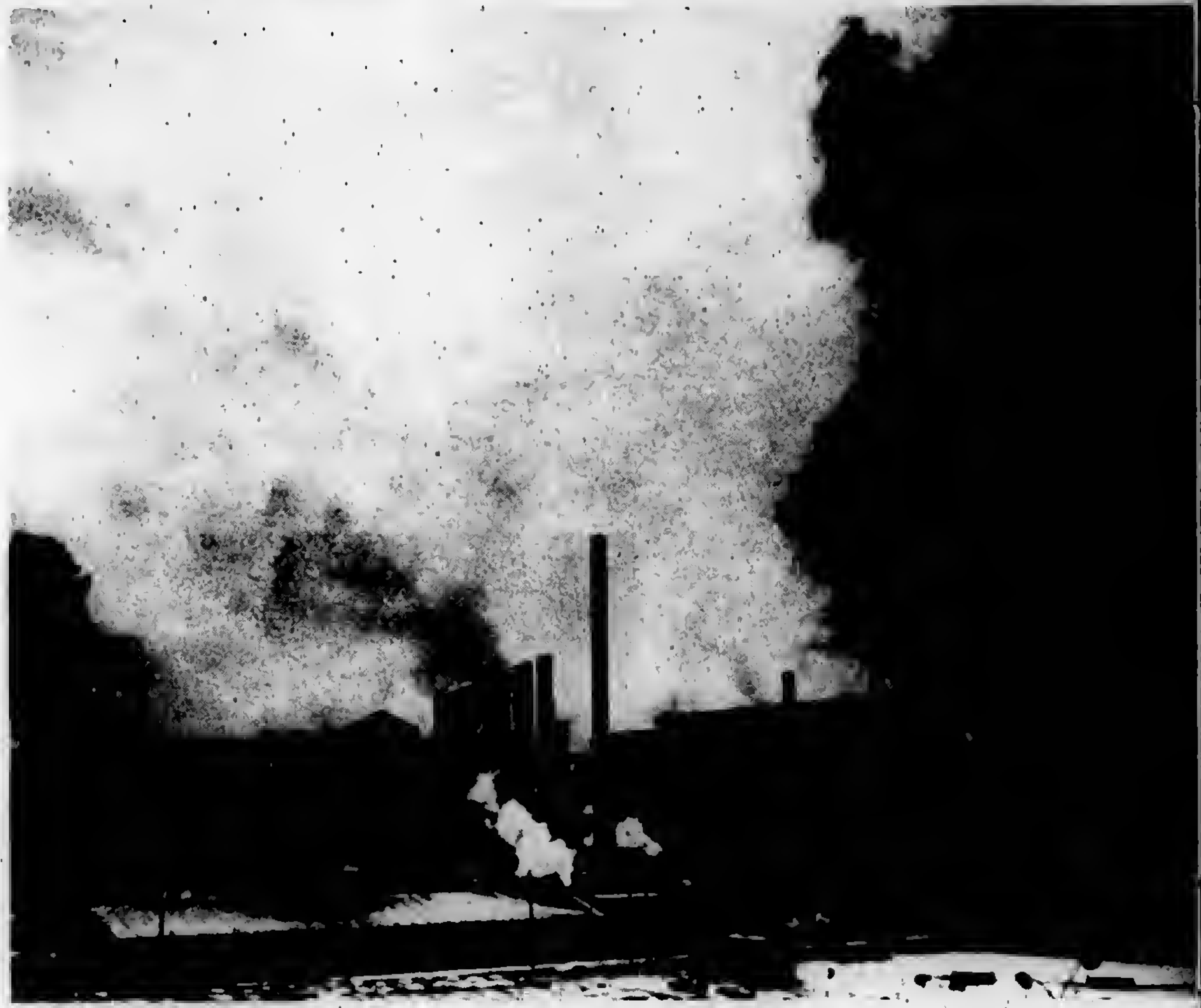

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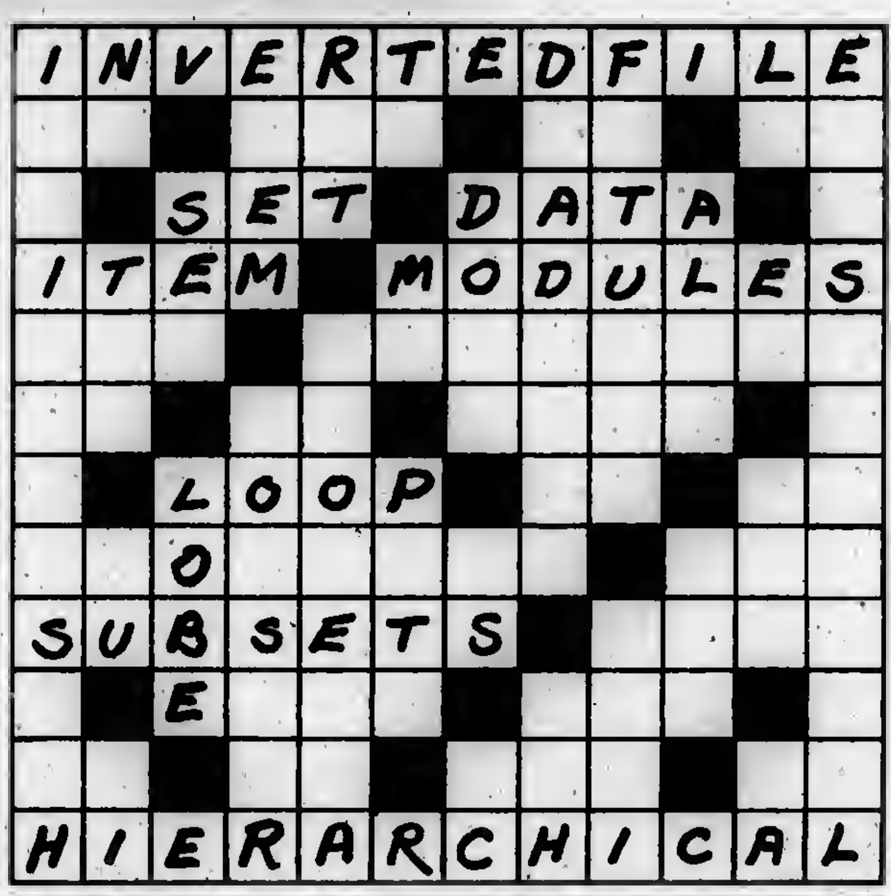
Solving the puzzle of data base management systems



A Computerworld Special Report
October 25, 1976

DBMS Only Partial Answer

Systematic Integration More Important Than Tools

By Chuck Lewis
Special to Computerworld

It is important to recognize the difference between "going data base" and "going data base management system (DBMS)." Unfortunately, many installations do not recognize this difference and go DBMS expecting the benefits of data base.

As a result, they often neither obtain these benefits nor expect the backout costs associated with obtaining them.

To avoid this problem, one should understand the differences between data base and DBMS and plan for data base.

Data base is an approach to data handling, whereas DBMS is a tool for data handling. Data base may employ a DBMS, but using a DBMS does not constitute data base.

Data base is a systematic methodology for the standardization and integration of data at the organizational level; a data base is a collection of data which has been organized by using such a methodology. A data base integrates all data, both automated and nonautomated, and can interrelate data across major functional boundaries.

Data Base Triangle

"Going data base" means an organization is establishing the administrative and technical positions, standards and manual and automated systems which are necessary to integrate the data and service the user community.

Data base design employs all the resources of the organization, creating a data base triangle (see Figure 1) composed of three major building blocks: hardware, software and personnel.

By assigning functions and facilities to each of these constituents in a balanced manner, the data base designer avoids overdependence (or resource skewing) on any one of the constituents, in addition to allowing room for future extension.

Going DBMS means an organization or, more typically, an application group is selecting and installing a DBMS for the purpose of implementing a major application on the computer.

Standardization is only accomplished within this scope, and integration with the other data resources of the organization is typically ignored or given token treatment.

Future integration of such data is assumed. Over time each major user creates a data base and contends for resources in a bottom-up fashion. This contention results from lack of planning or from not taking a data base approach from the outset.

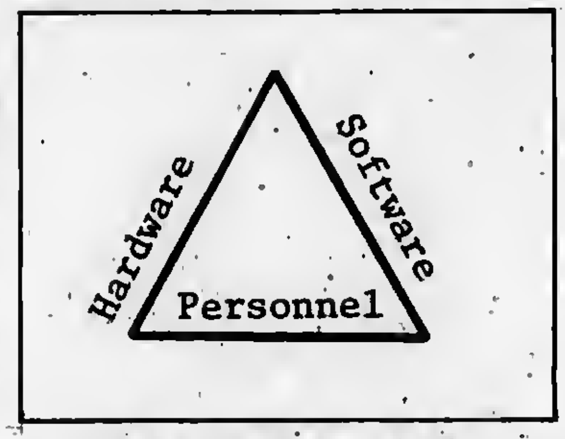


Figure 1. Data Base Triangle

Facilities and Functions

In both data base and DBMS, the required facilities, functions and data must be identified. However, the scope and design requirements of these facilities and functions are considerably different.

Data base functions include administra-

(Continued on Page S/8)

Future Needs Must Impact Evaluation

By David R. Sitek
Special to Computerworld

Assuming an organization has decided to evaluate commercially available data base management systems (DBMS) for immediate or future acquisition, it must then decide what level of effort it is willing to expend determining whether it needs the package and if so, which one.

The evaluation process must focus on the assessment of criteria which are not only critical to the users' current systems but are receptive to planned future applications and prospective systems software enhancements.

Depending upon the nature of the business, it may be advisable to issue a Request for Proposal (RFP) to those vendors who offer DBMS. The formality of an RFP forces the evaluators to carefully decide which elements are significant to the organization and should be stressed to the vendors, in their order of importance.

The naming of the evaluators is one of the most significant steps in the selection process. After all, their recommendations to upper management will most likely sway the final decision – unless there are political influences outside the scope of the evaluation.

The evaluation team should consist primarily of senior technical people thoroughly familiar with the organizations' applications, but include a representative of management who may ultimately be responsible for administering the package and can play the role of "devil's advocate" during the evaluation procedure.

Decision Matrix

Regardless of whether an RFP is issued or information is obtained directly from the vendor on an inquiry basis, a systematic means for evaluating this data should be devised early in the process. The classical approach is to set up a matrix containing those elements which should be carefully evaluated.

Each element should have associated with it a weighting factor which establishes its relative importance to the organization. It's a good idea to structure the matrix so the elements are listed from most to least important.

Each element, in addition to having a weighting factor attached to it, should be scored in accordance with how well it conforms to the organization's requirement. For example, a score of zero would indicate nonconformance whereas a score of five would indicate total conformance.

After the matrix has been completed each score is multiplied by its weighting factor and summed giving a total matrix score. Additionally, the matrix should be divided into two logical parts. The first part should contain those elements of the matrix whose conformance is absolutely necessary to the organization. These elements can be defined as "critical" whereas the remaining can be classified as "desirable."

Vendors may be eliminated from further consideration if they fail to conform to any of the critical matrix elements. (As a rule of thumb, the total points associated with those elements which make up the critical section should represent approximately 60% to 70% of the matrix's grand total points.)

The completed matrices can be used to eliminate vendors through the critical section concept or by analysis of the total score. For instance, if six vendors are evaluated, only the top two or three may be considered for further evaluation. Of course, it is possible the evaluation may end here with the high scorer being chosen.

Having selected vendors for further consideration, the evaluators should devise a scoring technique to assess other criteria, including package costs, user references and published independent studies (e.g., Datapro). Performance/cost and cost/performance ratios (representing relation-

(Continued on Page S/3)

Data Base System Can't Help Some Applications

By Ronald E. Morgan
And John Burke
Special to Computerworld

PLYMOUTH MEETING, Pa. – Betz Environmental Engineers (BEE) has used the data base management approach on several of its large water quality management studies. The requirements for such projects can be very stringent, i.e., many times a large volume of data must be established and functioning with report capability in a very short period of time.

In planning, organizing and controlling these processes, the data management system provides the necessary know-how to systematize the management of data and information. In such studies, planners are required to synthesize, reduce and interpret not only very large amounts of data, but also data that describes many different aspects of our environment at many different levels of detail.

This particular environment lends itself to the use of self-contained data base management systems (DBMS).

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The determination of "cost-effectiveness" is always a difficult one when data base work is involved. It is very difficult to put a dollar value on turnaround time and other intangible benefits of data base systems. The decision is further intangible because the very nature of a planning effort makes it difficult for one to know *a priori* how the data will be needed as the planning process progresses.

The problem is basically two-fold: whether computerization is warranted and whether to consider a conventional programming approach or a data management approach.

Many times the resolution of the first question comes as a result of considering the antithesis: "Can I manage the project totally through manual processing of the required data?" If after consideration of this question, the need for computerization is still unclear, further analysis of the data is warranted.

Seven Basic Properties

The consideration of seven basic properties of the data will greatly aid the engineer/planner in the preliminary aspects of considering the DBMS approach. These

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This special report was prepared under the direction of CW Associate Editor Don Leavitt. Cover art by Henry Fling.

'Distributed Data Base' Covers Range of Forms, Range of Users

By Mike O'Connell

Special to Computerworld

Everybody talks about distributed data bases, but we all seem to mean something different. That's because there are several forms of this capability, each one suitable to a certain class of application systems. I call these forms distributed access, distributed independent and distributed integrated.

Distributed access is the simplest to achieve and is in use on every system that has remote terminals. Distributed access really has nothing to do with distributing a data base itself; instead, the data base remains centralized and access to the data base is distributed through interactive terminals.

This gives the user the illusion of distributing the data, but permits the applications programmers and data base administrators to work with a single centralized system. Response time for the user and the cost of communications lines may render this choice too slow and/or expensive.

The second form, distributed independent, involves a series of computers, each with a data base of its own, connected through communications lines. Applications programs running on a given machine view that machine's data base as the centralized data base.

However, when that program needs data that exists on another machine in the network, the application must send a message to a sister program running on that other machine, requesting the appropriate data access. The sister program then accesses its own data base and transmits the results back to the original requesting program.

Another way to view this process is to treat the requesting program as if it were a remote terminal in the distributed access mode discussed above. Implementation of this form requires the presence of any so-called centralized data base system and the presence of any network communications software that permits applications programs to send messages to several remote computers.

Each data base is designed as an independent entity and the burden falls on the application programs to determine which machine has the desired data and whether to send a request to the local data base system or to a remote program.

This method cuts communications costs over the distributed access method, because data is stored on the machine nearest the highest volume users, and only requests for seldom-needed data are sent to remote computers. The disadvantage, however, is that programs must know exactly where in the network the data resides, and when data moves from machine to machine to reduce costs, all programs that use that data must be modified.

> *'Communications software is still in its infancy and data base management software is younger still.'*

The design of each data base is simple, since each one is only a part of the entire network of data, but the simplicity of design is more than offset by the application programs having to understand the design of all data bases they access.

Ideal Form

The final form, distributed integrated, doesn't exist today in any general-purpose system. With this form, the data base administrator designs the entire net-

(Continued on Page S/8)

Selection Care Vital to Future

(Continued from Page S/2)

ships between cost and evaluation matrix scores) should also be considered. The user contacts should indicate support personnel required, the number and types of critical vendor calls and the time for the vendor to respond to critical calls.

Vendor Presentations

At this point, it may be advantageous to invite vendors to give presentations — separately — at the evaluators' site. In addition to whatever "canned" marketing pitch each vendor might have, these sessions should include question and answer periods to clear up loose ends.

The above evaluation criteria can be used with the evaluation matrix scores to make up a summary matrix in which each major category is weighted according to its importance. Then a final score for each vendor is compiled. The vendor with the highest score could then be selected or, if two or more vendors are still very close, further evaluation and narrowing of the field could ensue.

Final Test

This might be the time to conduct a benchmark, but probably for no more than two or three packages since the cost of more may become prohibitive. The benchmark should support or nullify claims which the vendor has made, establish whether a typical customer application with its associated data can be successfully handled and provide some evidence of the efficiency of processing each package.

In order to conduct a fair and meaningful benchmark, the following rules should be observed for all vendors:

- Run the test at customer's site.
- Use known customer application.
- Complete the benchmark within a given time frame.

For his part, the user must:

- Assign technical personnel from the evaluation committee to work closely with the vendor.
- Have a specific technique for evaluating all areas of the benchmark.

Measurable outputs of the benchmark should include:

- Program execution times.
- Data load rate.
- Main storage and auxiliary storage utilization.
- Elapsed wall clock time.
- Data retrieval times.
- I/O activities (how many I/O's to satisfy a particular data requirement).
- Device time by unit.

Less quantifiable, but just as significant, would be judgments on ease of use of package modules and associated documentation problems encountered throughout the benchmark and quality of vendor support.

The summary matrix score combined with the results of the benchmark should provide adequate information for selection of a vendor. The final selection may also be influenced by the fact that the product comes from a vendor with whom the customer has done business in the past and who has a feeling for support and quality of the product.

Whatever the final decision, the effect on the organization as far as its future performance is concerned could be seriously impaired if the selection process is taken lightly.

Sitek is data base administrator with the Office of Computer Services & Information Systems, Metropolitan Dade County, Florida.

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Wisconsin Team Sees Benefit, Cost of In-House Effort

By Barry L. Larson

Special to Computerworld

The Wisconsin Department of Transportation installed a data base management system (DBMS) in February 1974 which is unique in that all data access is performed at the data element level.

The past 2-1/2 years have seen three major application systems put in production under the DBMS, with a fourth scheduled by the end of the year. Production operation of the data element-oriented DBMS provides considerable insight into the strengths and shortcomings of such an approach.

The department embarked on the data base path in early 1971, beginning with a lengthy evaluation of data base management and data communication systems then on the market. The major objective was to find a DBMS that could be used to support the department's two major Division of Motor Vehicles applications, the 7-1/2 million record vehicle registration and drivers license systems, in an on-line update environment. The investigation revealed that none of the products available met the needs of the department.

Following this evaluation, the department made the decision to begin in-house development of a DBMS which would be more suited to the extremely large volume, "flat" file characteristics of the two major motor vehicle applications. A software development project was initiated in early 1972 and was successfully concluded in February 1974 with the implementation of the data base/data communication support system, which comprises about 100,000 lines of source code.

The heart of the system is the data element dictionary that describes every data element known to the system. It gives the data element name and describes the data element attributes for its physical and multiple external representations; it also specifies the required mapping transform needed to convert from one representation to another. In addition, the dictionary indicates the physical file on which the element resides as well as the access strategy to employ in obtaining it.

The file structure is best characterized as a wide, flat file capable of being fully inverted. The records are variable length, utilizing a bit map to indicate the presence or absence of the data element values within the record. A hashed index file is maintained for each data element that is inverted. These index records contain the address of the block in the directly addressed master file that contains the related data element values.

> *'The high degree of application program/physical file independence provided by the DBMS is undoubtedly its greatest strength.'*

All application program data base accesses, both batch and teleprocessing, are done at the data element level; the requesting program merely supplies a list of data element names it wishes to operate on. A representation number is appended to each data element in the request list to specify to the DBMS the particular external representation of the data element with which the application program is dealing. The qualification, or key, is capable of handling Boolean expressions and is also specified in terms of data element names and representation numbers.

The high degree of application program/physical file independence provided by the DBMS is undoubtedly its greatest strength. New data elements can be added to existing data bases by simply defining the new elements in the data element dictionary and including the element in those programs which deal with it.

Changing Devices

A data base migration from one device type to another has been accomplished; it required only execution JCL changes to the DBMS and no application modification. This occurred in early 1974, when the 4-1/2 million record vehicle registration data base was moved from 2314- to 3330-compatible disk storage.

An operation quite similar to reordering a record layout in a conventional file arrangement has also been performed. This was done to the vehicle registration data base during production test, illustrating that physical data base records can be restructured transparently to programs using the data.

Another benefit of the data element approach is that it promotes the compilation of an inventory of the data elements used by an organization. Since detailed definition is required for each data element contained in the data base, assembling a complete catalog of an organization's data elements becomes a natural follow-up.

The department's reduced disk space requirement is also due, in large part, to the element approach. The 4-1/2 million record vehicle registration data base, including three random indexes, occupies nine spindles of single-density 3330-compatible disk, less than the conventional file it replaced. Estimates developed during the 1971 DBMS evaluation indicated about 36 spindles would have been required to implement the same data base under a currently available commercial DBMS.

Much of the economy of space is achieved by carrying only real data element values in a data base record. Those elements not having a value in the record are said to be null and require no filler to be carried.

Since access is at the data element level and mapping from the internal to external representations is always required, it is convenient to encode many of the element values, providing an additional economy of space. Blank compression is also performed at the record level, further reducing the space requirements.

Availability is enhanced by minimizing the need for reorganization of the data base, with its attendant outages. The vehicle registration data base required its first reorganization 18 months after implementation, and then only because the growth in the file size required that additional disk space be allocated.

This data base, incidentally, is rather volatile, with approximately 90,000 to 100,000 updates applied per week. The influence of the data element approach is also evident here, in that it lends itself to a flat file organization which minimizes chaining and the subsequent need for frequent reorganizations.

In summary, the Department of Transportation has found that a number of very real productivity benefits can be derived from the data element orientation. These benefits come at a price, however, and that price is the equipment cost, or CPU cycles, needed to support the DBMS.

Larson is an analyst with the Bureau of Systems & Data Processing, Division of Business Management, Department of Transportation, State of Wisconsin.

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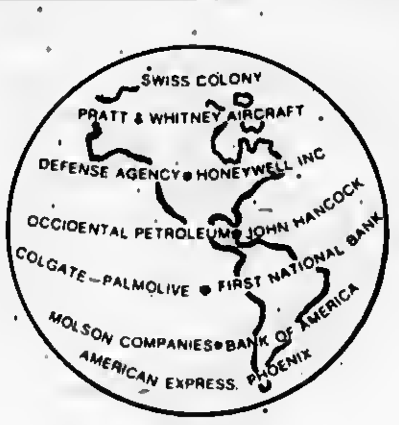
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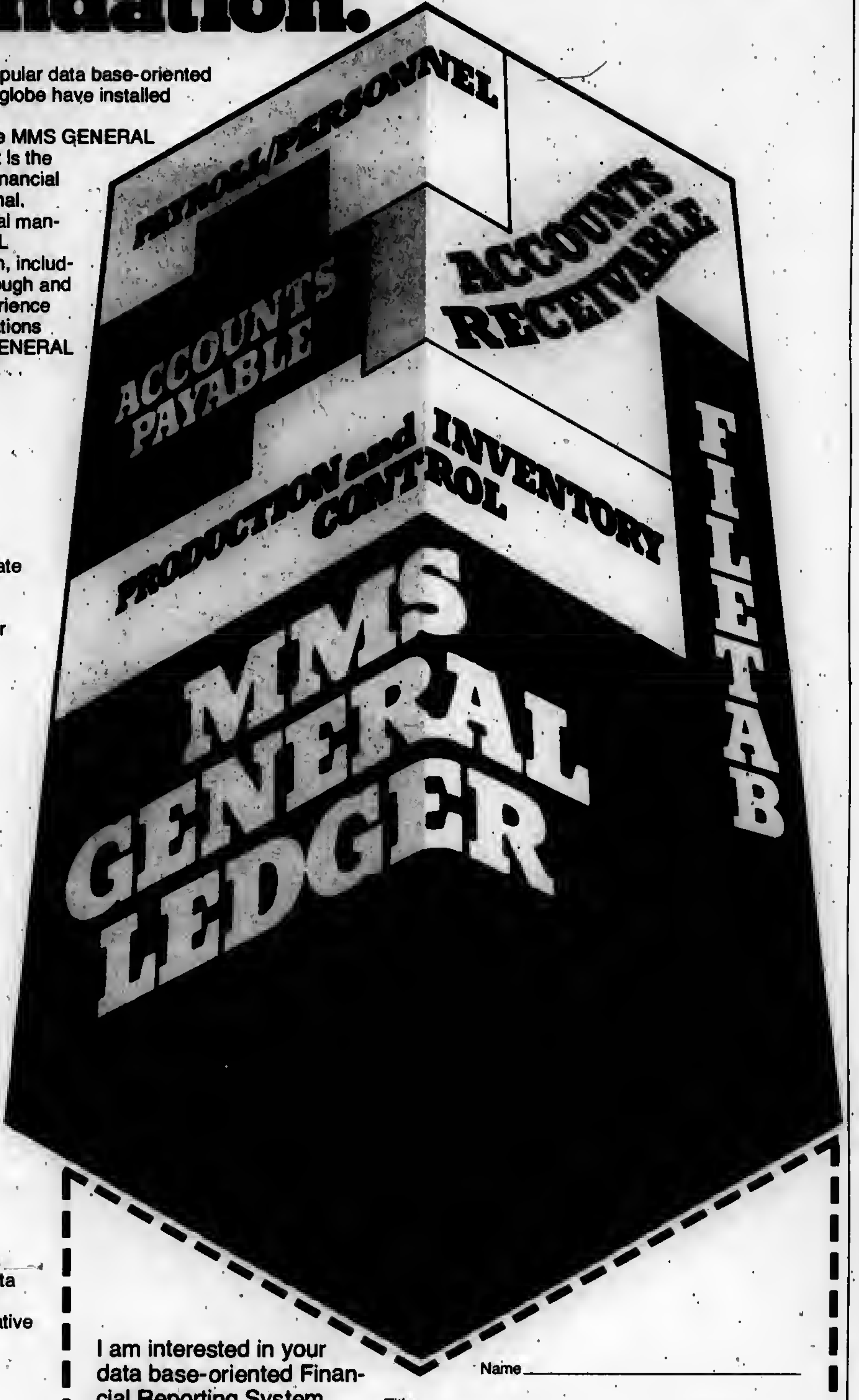

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Working With GE Network

'Datacore' Tracks Education Trends for State Unit

ALBANY, N.Y. – An office of the New York State Education Department has set up an information system called Datacore that can quickly and efficiently retrieve enrollment and other data vital to the analysis of postsecondary education trends. This would have been a nearly impossible task without the facilities of the Data Management System (DMS) which is available on a time-shared basis through General Electric's Mark III network, state officials noted.

The Office of Postsecondary Research, Information Systems and Institutional Aid (Oprisia), headed by Dr. Paul Wing, is responsible for compiling the data and providing analysis and interpretation on a timely basis. This is a critical aspect for such functions as fiscal planning, developing financial aid strategies and enrollment projections for approximately 250 degree-granting institutions in New York State.

As the number of students attending New York State's degree-granting institutions neared the one million mark, accompanied by pressing fiscal circumstances of both the state and the nation, Oprisia sought a method capable of managing the multitude of data necessary to assist the department's postsecondary planning function.

"With Datacore, we're doing something that was practically impossible just two years ago," Wing said. "When information was requested it was often late, required a tremendous amount of clerical work and its usefulness was generally diminished."

Condenses Data

Now, since Datacore serves as the repository for official historical data from 1969 to the present for all postsecondary educational institutions, Oprisia can access any of its 2000 master records and 12,000 dependent records, containing close to 100 data elements, to gain information useful in analyzing trends, answering requests from various sources and preparing reports for a multiplicity of state agencies.

Datacore contains data regarding the type of institution, such as whether it is a four-year university or a two-year community college, its location, various enrollment statistics, and information concerning admissions, degrees granted and facilities. The data base is organized in a DMS hierarchical structure, allowing for a natural and efficient configuration of related data that can easily be modified. In the near future, Wing said, financial and budgetary data will be added to the system.

When information updating is required, an average of twice each month, data gathered by the department's Bureau of Statistical Services is provided to Oprisia. The updating module is then executed in a deferred mode for overnight processing.

One of the key reasons for using DMS in developing Datacore was the data base management system's quick and easy start-up and simplicity of operation, which Oprisia found particularly appealing, according to Wing.

"DMS has reduced the need for computer programming expertise in our operation," Wing said. "In fact, no one in the office really had much computer expertise when we first undertook its development."

Dave Waters, an Oprisia education aide, has handled Datacore through its initial developing stage, but will soon do more analysis and interpretation work as the responsibility of the system's operation falls to a clerk and an Oprisia entry-level professional.

"DMS has allowed Datacore to provide information very fast and in an organized manner," Waters said. "Consequently, we have increased our effectiveness."

The English-like retrieval and reporting language of DMS allows the user to generate ad-hoc reports to fulfill unanticipated requests in an efficient manner. For example, the office was able to provide the Region II Office of Health, Education and Welfare (HEW) with information related to the Federal government's swine flu vaccine program. HEW needed to know the number of full-time and part-time students in New York State's 250 postsecondary institutions. Before Datacore, the headcount would have had to be done manually, tying up several persons for hours, according to Waters.

Datacore is used daily by Oprisia as it receives requests for information from many government agencies, including the governor's office, state legislature and from within the education department. Wing said most requests for basic information are answered within 15 minutes.

Besides providing a variety of requestors with information, Oprisia uses the system to prepare comprehensive annual reports on enrollment, degrees granted, graduate and undergraduate admissions and facilities for department use in planning and forecasting. One of the more complex problems solved by Oprisia is the forecasting of student participation in New York's postsecondary institutions as far as 18 years into the future.

Wing sees Datacore as a computerized information system that provides the department and others with timely information about postsecondary education in New York State, whether it be answers to simple requests for statistical data or finished comprehensive reports.

The system's success in providing such information quickly and efficiently has resulted in plans for its expansion into other informational areas that could be of vital importance to postsecondary education, according to Wing.

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Systematic Integration More Important Than DBMS

(Continued from Page S/2)

tion and control; definition; maintenance; data collection and dissemination; and privacy, security and integrity protection.

To implement these functions, the data base designer may employ a DBMS, data dictionary, sequential files, manual files, intelligent terminals, minicomputers, manual forms and procedures, hardware redundancy, encoding/decoding standards, data administrator and multiple data base administrators.

DBMS functions are very similar to data base functions (one source of confusion), but because the scope is considerably smaller, the facilities used to implement these functions include query languages, host language interface, hierarchical and network file structures, report writers and data base administrators.

In approaching data base, a catalog of the functions, data and relationships necessary to support the various stimuli of the organization must be developed to ensure appropriate data base design and selection of hardware, software, personnel and administrative policies and procedures.

A major objective is to minimize the storage, software, maintenance and staffing redundancy in the organization.

In approaching DBMS, all organizational functional areas except one or two are basically ignored. The development team is only concerned with data to be automated by way of the DBMS.

Often the team is indifferent to other users of the DBMS because no one oversees sharing of the DBMS. A major objective is to minimize redundancy within the file through the structuring facilities of the DBMS.

Of course, going DBMS rather than data base is often a matter of practicality. Either the time, money or senior management support required for the front-end analysis and planning required by data base is not available. Data base is an organizational decision; DBMS is a systems programmer decision.

In such cases, after exhausting all possible means of acquiring these resources, it should be clearly understood and documented that the move to DBMS is to satisfy specific automated requirements.

There are installations, however, which may be in a position to go data base, but choose to go DBMS because of a lack of foresight.

This is a mistake.

When you are investing $1 million to $3 million in DBMS, investing $75,000 to $200,000 and five to 10 months in a front-end study and education program to make sure you are doing the right thing in the long run is very affordable.

Benefits Not Realized

The danger of going DBMS is not only that data base benefits may not be realized. An organization can work its way into a situation such that conversion or "phasing into" data base may only be accomplished by backing out a high percentage of the software and effort that went into going DBMS.

This can occur when insufficient initial requirements analysis is performed before the data base administrator, DBMS, data dictionary and teleprocessing monitor are selected and when use of the software and development of new systems by various groups is not coordinated.

When one considers the move to DBMS may amount to millions of dollars of effort over two to four years, this is a considerable risk.

In short, going DBMS can, in two to four years, lead to the same problem (i.e., redundancy, lack of coordination and limited growth potential) it is designed to avoid now.

The trade-off between DBMS and data base is short-term results vs. long-term potential. Few organizations will commit themselves to a five- to seven-year data base plan without seeing short-term results. Likewise, few organizations will knowingly commit to a two-to-four-year DBMS plan without seeing long-term potential.

The resolution is to adopt a top-down approach to data base. Analyze all the entities and stimuli of the organization and the corresponding data and functions, acquire the appropriate resources and then implement data base in stages.

Major Tasks

The major tasks in this approach are as follows:

- Establish data base with the aid of the data administrator. Assign the data administrator the task of implementing data base within the organization and give him the senior management support, time and capital necessary to perform the following steps.

If it is not politically expedient to establish this position initially, a team of consultants can be used to perform the subsequent steps. However, the establishment of the data administrator and firm senior-management support should not be delayed for long.

- Establish the data base analysis/design team. Choose backgrounds and contacts and educate the members as to what they are trying to accomplish.
- Perform an operations analysis. Identify the candidate operations to be represented in the data base. Determine expected costs, benefits and milestones for its development. Examine alternatives and perform a feasibility analysis. Make a go/no-go decision.
- Perform a systems analysis. Define the operations of the organization in terms of entities and stimuli. Translate these into data and functions.

Define data sources, users, redundancies, ambiguities, relationships and terminology. Define the data, relationships, frequency of use and response requirements for each function.

Build a data model, functional model, organizational model and a list of necessary standards. Balance the mapping of data and functions into hardware, software, personnel and manual systems.

Adjust the mapping to constituents and produce specifications for the necessary tools – including the DBMS.

- Acquire the necessary tools (DBMS, hardware, other software, personnel, etc.) to implement the first phase of the data base and proceed with development, conversion, standardization and implementation.

Go DBMS on a target area and prepare other areas for integration and elimination of redundancies through standardization.

- Gradually move from DBMS to data base.

Lewis is manager of the Database Services Department of CACI, Inc. in Reston, Va.

Definition of Distributed Data Bases Confused

(Continued from Page S/3)

workwide data base as a single integrated data base, as though it were to be centralized. The application programmers see this single data base and write their programs as though there were a centralized data base.

However, when the data base administrator maps the data base onto disk files, the mapping involves disk files that happen to be attached to several remote computers, instead of all being attached to one monolithic computer. This method permits a single integrated view of the entire data base with its simpler control and applications programs.

In addition, the data base administrator can freely move data from computer to computer without impacting application programs.

Implementation of this method requires the vendor's data base management software and communications software be integrated to talk to each other. An application program's request for data base services is handed to the data base management system (DBMS) residing on that same computer.

If the DBMS determines the requested data is on the same computer, it is accessed. Otherwise, the DBMS must request its communications software to send a message to another computer in the network.

The work to be done with this method is identical to the distributed independent method, but the responsibility for doing the work is shifted. With distributed independent, the application must make the decisions and make the right requests of the right computers. With distributed integrated, the burden falls on the vendor's software, and the user's programming chore is much simpler.

Today's user who has a computer with remote terminals already has distributed access. Today's user with a network of computers connected by programmable communications software can achieve distributed independent, but with a great deal of planning and very complex applications programs.

It seems clear that the user of tomorrow will want the best of both worlds, with the simplicity of distributed access and the power of distributed independent, which I've called distributed integrated.

Communications software is still in its infancy and data base management software is younger still. It won't be long, though, before each of these technologies will be firm enough to permit the careful grafting of one onto the back of the other to provide power and flexibility of data access to match the power and flexibility already recognized for distributed computing systems.

Offload Communications

On a slightly different subject, there seems to be a great deal of interest in distributing the load of a single processor, even when no remote computers exist. This interest has arisen from the success of front-end communications processors which serve to offload the message-handling task onto a computer specifically configured to do that specialized job.

But if offloading the communication with terminals is a good idea, why not offload the communication data bases? In other words, why not have a closely coupled system with a communications front end, a general-purpose processor and a data base back end?

Some experimental work has been done in this area and a number of studies have been funded to determine the optimum approach to this problem, but no general-purpose system is offered today to provide this capability. The user who wants to do it without waiting for the vendor must have a hardware configuration that permits processor-to-processor communications at a high data rate and must be willing to write specialized applications programs that communicate between the central processor and the back-end processor that contains the DBMS.

O'Connell is a product planning and promotion manager at Digital Equipment Corp. and chairman of the Codasyl Data Base Language Task Group.

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Space Saving Biggest Problem

Many Options Open to Users Who Want DBMS on Mini

By J. Aaron Zornes

Special to Computerworld

Few minicomputers are equipped with the software selection delivered with large machines. However, the usual restraints of a mini system often mean data redundancy is a serious problem and data base management systems (DBMS) are needed.

Various vendors have begun to respond to user requests for DBMS and packages are currently available from:

- Minicomputer manufacturers. Digital Equipment Corp. (DEC) has released Record Management Service-11 (RMS-11). For the PDP-11/70, DEC has worked with Cullinane putting together DBMS-11, an adaptation of IDMS. Other manufacturers with packages available or close to release include Hewlett-Packard (Image), Interdata (Interbase) and Data General (Infos).

- Independent software houses. ELS Systems Engineering offers Product 3 for DEC's PDP-11 and for other minis on special order. Cincom Systems has Total for Varian and other systems, and minicomputer software directories show about 20 other DBMS available for the more popular minis.

If your particular mini has no DBMS currently available and you don't want to tie up your staff writing data base software, your options are switching to a vendor that has – or soon will have – a DBMS, contracting with a software house to design a system for your mini or converting a successfully running data base package to your mini.

> *'Once a system is in place, the "turnpike" effect will also make itself felt. As the system becomes operationally successful, more and more large applications will come on board and the internal resources may be strained.'*

The second option has advantages. You will get, presumably, a working system and it will not tie up your systems people in the development phase, assuming the vendor has experience developing data base software and is familiar with the features of your mini which can be built into a DBMS.

Transporting and tailoring a system to a new environment can be a nightmare. The headaches unique to a DBMS can be minimized, however, if you:

- Choose a system that is running successfully on another machine, not excluding large computers. Don't be a test site for unproven software.

- Capture a highly portable system, written in the same high-level language your mini supports.

- Get involved at the systems level, even minimally, to guarantee in-house maintenance capability later.

- Recognize that a running system gets the job done. On your configuration, however, you can fine-tune the software as time allows.

- Recognize that transporting the programs across vendor lines may require some planning and work, particularly if I/O modules are device-specific.

- Assign a person knowledgeable in the use of DBMS – usually the project leader – to resolve system problems.

The cost per line of code is roughly the same for the system whether it be large-scale or mini. On a mini, however, moving data around is no bargain: bit manipulation has to be done in Assembler.

A mini also has slower compilation, linking and loading times which add to development costs. An alternative is to use a cross-assembler to develop and test code on a large system and then move the object code back to your mini for use.

In order to fit the DBMS, operating system and application programs into a mini's generally limited main memory, the data base control system should be as compact as possible. Some features of larger DBMS – editing routines or other protective mechanisms, for example – may have to be omitted.

Since most minis are located away from experienced personnel, documentation has to be fairly straightforward and system generation, recovery and restart procedures have to overcompensate for the lack of knowledge on the part of the user.

Once a system is in place, the "turnpike" effect will also make itself felt. As the system becomes operationally successful, more and more large applications will come on board and the internal resources may be strained.

Zornes is a systems programmer at Diversified Data Systems, Tucson, Ariz.

'Base' Approach Wrong for Some Data

(Continued from Page S/2)

properties are:

- Ultimate size of the data base. This property alone can often be the decisive one. If the data base is large, manual manipulation will simply be too time consuming and error prone.

- Structure of the data. This also is a very important question when considering a DBMS. For instance, if one is inventorying n facilities, each with exactly two pipes and discharging exactly four parameters, then a DBMS is probably not justified. On the other hand, if a given facility may have from one to 30 pipes, each discharging one or more of 70 different possible chemical parameters, then a more versatile structure (such as a DBMS) is definitely worth consideration.

- Data relatability. This property is a measure of the overall "relational" aspects of the data. If the data has "relational" properties, then a relational data base should be considered. For example, in a water quality management planning process, data collected at a sampling station only takes on meaning as it is related to upstream industrial and municipal facilities, upstream water quality and overland nonpoint source loads.

- Variability of the data elements. This property is a measure of the time variability of a given data element's intrinsic properties. The critical examination of this property gives the decision-maker a feeling for the overall stability of the data. DBMS tends to be more effective at handling data which changes frequently.

- Variability of the data base. This property is a measure of the rate of change of the data base itself. For example, how often will it be necessary to add, delete or change the data items. Under classical programming techniques, every time a data item is added to or deleted from a given file structure, all programs accessing that file must also be changed. However, within the structure of DBMS there is an independence between the program and the data. If the data has a potential for a large number of changes, DBMS can be very cost-effective.

- Number of different ways the data will need to be reported. This property is an attempt to measure the frequency and types of reports required. If information demands the data be displayed in many different ways or if it is not certain how the data will be required, the DBMS approach has distinct advantages over a more conventional approach.

However, if a set of reports is required at regularly specified intervals, DBMS could be very costly to use. Thus, if the types of reports required are not well specified or if reports are required very quickly on the spur of the moment (i.e., an on-line inquiry situation), DBMS will tend to be very cost-effective.

- Number of different types of users of the data. The other six properties previously discussed are not necessarily independent of this one. The more different types of uses the data base will be subjected to, the more difficult it will be to define the variability of the data and data base and the different ways the data will need to be accessed and reported.

Cost Estimates

For some cost guidance, we have prepared cost estimates for three of our larger data bases. We should point out, however, that costs will vary depending upon the DBMS used, the size of the data base and the complexity of the data base.

To obtain a "usable" measure, we decided to use the "cost per data item" to establish, verify and update the data base. This will simply be calculated by adding the costs for data entry and programming for the establishment, verification and update of the data base to the computer costs (CPU usage, connect time and storage) and dividing that sum by the total number of data items on the data base.

$$Md = \frac{\text{Manhour Cost + Computer Cost}}{\text{Data Items}}$$

The following table summarizes our costs on three projects:

	Manpower	Computer	Total
A	$1,400	$1,300	$2,700
B	$1,700	$1,600	$3,300
C	$13,800	$7,000	$20,800

The number of data items can be calculated by multiplying the number of occurrences at a given level times the number of data items at that level and summing over all levels. In summary:

Data base	Total No. of Items
A	37,000
B	25,000
C	222,000

Dividing these by the implementation costs, we get costs per data item established.

A – 2700/37000 = 7.3 cents
B – 3300/25000 = 13.3 cents
C – 20800/222000 = 9.4 cents
Average = 10 cents

We certainly cannot conclude that all data bases, even if established with Nomad, will cost 10 cents per data item: The cost will vary in accordance with the size and complexity of the data base established.

Morgan and Burke are systems analysts with Betz Environmental Engineers, Plymouth Meeting, Pa.

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Mini-Based System Backs Long-Range Louisiana Plans

BATON ROUGE, La. – Long-range planning for a city, county or state is an art that can probably never be completely computerized, but the data needed for planning can be collected and structured into an information system and made readily accessible for planning decisions. Louisiana's State Planning Office (SPO) is implementing just such a system.

The project began four years ago and now brings together the source data of hundreds of state and local government agencies and makes it usable for long-range planning. The SPO uses a Data General Eclipse C/300 that functions both as a local processing system and as a remote job entry Hasp workstation to an IBM 370.

"We chose the Eclipse to supplement the large computer because it was able to meet our specifications of flexibility, extensive software support and data base capability. It also met our budgetary constraints," Paul R. Mayer Jr., assistant director of the SPO, said recently.

Part of the governor's office, SPO is chartered to advise the executive branch on matters of planning and development at the state level, as well as other branches and levels of government on request. The SPO also serves as a consultant to regional, local and specific interest groups.

To supply these services, the SPO has a legislative mandate to "identify all information to be collected and assembled with respect to the goals of the state and the development of programs and plans affecting the state and is responsible for the establishment of basic statistics to provide a common source for all planning." It then must "collect, analyze and report physical, social and economic information to state government operations."

The Comprehensive Planning Information System (CPIS) is a result of this mandate. "We first became interested in a data management system when we found the types of data we needed to perform our planning functions were not available," according to Mayer. Secondary sources were never up-to-date, or the data was in a form we couldn't use, and consultant's studies were outdated when we received them.

Multiple Needs

The basic informational needs of the SPO include both data for special one-time projects and data used over and over again, such as the results of a census. The storage, facilities and data file organizations as well as the processing, programming requirements and data integration procedures vary considerably for each.

Activities as different as routine report generation and economic modeling require different operating procedures, hardware and software capabilities and programming support. All these factors had to be considered in the CPIS design.

The CPIS also had to solve three major information-related problems: first, the lack of good data; second, discrepancies between data collections from the various agencies, due to different calculation methods or incompatible data bases; and third, inefficiency of locating data through personal contacts and accessing the data once located.

Another group of problems concerned the system itself. Without an in-house system or communications access to a host system, the SPO staff's use of computers was dependent on the priorities of other agencies. Timely DP support could be obtained only in high priority situations, and then only at a high time/cost trade-off.

In addition, incompatibility between computer systems made it difficult to execute a planning project that required data or programs from several unrelated systems.

The SPO also had to factor in the nature of its own functions. While system devel-

(Continued on Page S/12)

Relational System Adapts to Changing Aims

By Don Leavitt
Of the CW Staff

WARREN, Mich. – The main power of the Relational General Information System (Regis) installed at the Research Laboratories of General Motors Corp. here is its ability to handle unplanned queries and to enable the user to work with intermediate results to determine the future course of his analysis, according to two of the laboratories' computer scientists.

In a paper prepared for the 1976 National Computer Conference, John D. Joyce and Nissim A. Oliver explained that in the design of Regis "an emphasis is placed on providing a view of data in which the relationships are easily understandable and easily manipulated to derive new relationships."

Of particular importance, they noted, is the capability to handle groups or sets of information. "This is different from handling one record at a time such as in the Codasyl Data Base Task Group approach," they added.

While Regis supports an interface to programs written in conventional high-level languages, it also – perhaps more importantly – has a substantial command language of its own, plus linkages to statistical analysis and flexible graphic output routines, Joyce and Oliver said.

Developed from the experimentation, design and implementation work of Dr. Kevin Whitney, and now running on an IBM 370/168 under the TSS operating system, Regis is clearly designed primarily for the interactive mode in which the user can extract and analyze information and make analyses based on the information he has just learned.

'Jargon' Inappropriate

The users' view of a relational data handling system is markedly influenced by the approach and terminology by which the subject is introduced to him, the authors said, adding "some of the precise terms of relational theory are simply not appropriate to use with potential users."

"The user must be approached with simple terminology and meaningful explanations of the concepts and ideas involved . . . Potential users, including ex-

(Continued on Page S/12)

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Chair Maker Cuts Inventory as Production Jumps

MONROE, Mich. – Data base techniques have been a key behind La-Z-Boy Chair Company's reduced inventory and increased production, according to Otto Smoktonowicz, the company's manager of programming and analysis.

In the last two years the company has reduced its inventory of covering materials from 2.3 million to 1.3 million yards and has increased the chair production rate at its seven manufacturing plants from 3,500 to 4,500 chairs per day, he said.

Cover is La-Z-Boy's most expensive inventory item. Two years ago, the company's 2.3 million yard inventory was valued at $5.5 million, he noted.

In the past, the 1,000 stocked covers needed for production of the company's 250 manufacturing styles were ordered from the mills for direct shipment to the seven plants. Plant receipts were hand-posted to ledger cards and then entered into computer inventory.

Under this system, on-hand inventory was inaccurate, often causing expensive interplant shipments and production delays despite the large inventory, he said.

"If a figure was within 50% of being accurate, it was considered good," Smoktonowicz remarked. "Corporate management decided there had to be a way to reduce inventory and, at the same time, make inventory allocation more accurate and timely."

Distribution Center

As a result, La-Z-Boy established the Fabric Processing Center as the central warehouse and distribution point for all cover needed on a corporate basis, he said. The center, in turn, ships cover on an as-needed basis to the company's seven manufacturing plants.

The center has a completely automated storage and retrieval system which is run by a minicomputer, he noted.

Tape-to-tape transmission links the minicomputer with La-Z-Boy's NCR Century 251 computer which is located at the company's main DP center here.

Using data base techniques, the CPU has been programmed to consider a variety of data including on-hand inventory, purchase orders, expect-to-ship dates, mill returns and lead times, items in transit and uncut backlogs in determining a priority basis of allocating cover to the manufacturing locations, he explained.

However, management still has the option of overriding the priorities established by the computer by ordering a "forced pick" when necessary, he noted.

An outstanding feature of the system is its ability to operate in an analysis mode, according to Smoktonowicz. This enables La-Z-Boy to assess how a shift in cover allocation priorities would affect each plant. This assessment can be made without making a commitment to the proposed change.

"Suppose a big order has just come in for a chair style manufactured at one particular plant," he explained. "Management may think so many yards of cover should immediately be shipped to this plant to meet the new demand.

"However, before making that decision, management may want to examine what such a priority shift would do to the other plants," he added.

"Using the analysis mode, management will have its answer within 18 minutes. All of the necessary calculations will be made without changing one bit of data in the base," he said.

The company looked at sequential and index sequential processing before deciding on data base, Smoktonowicz indicated.

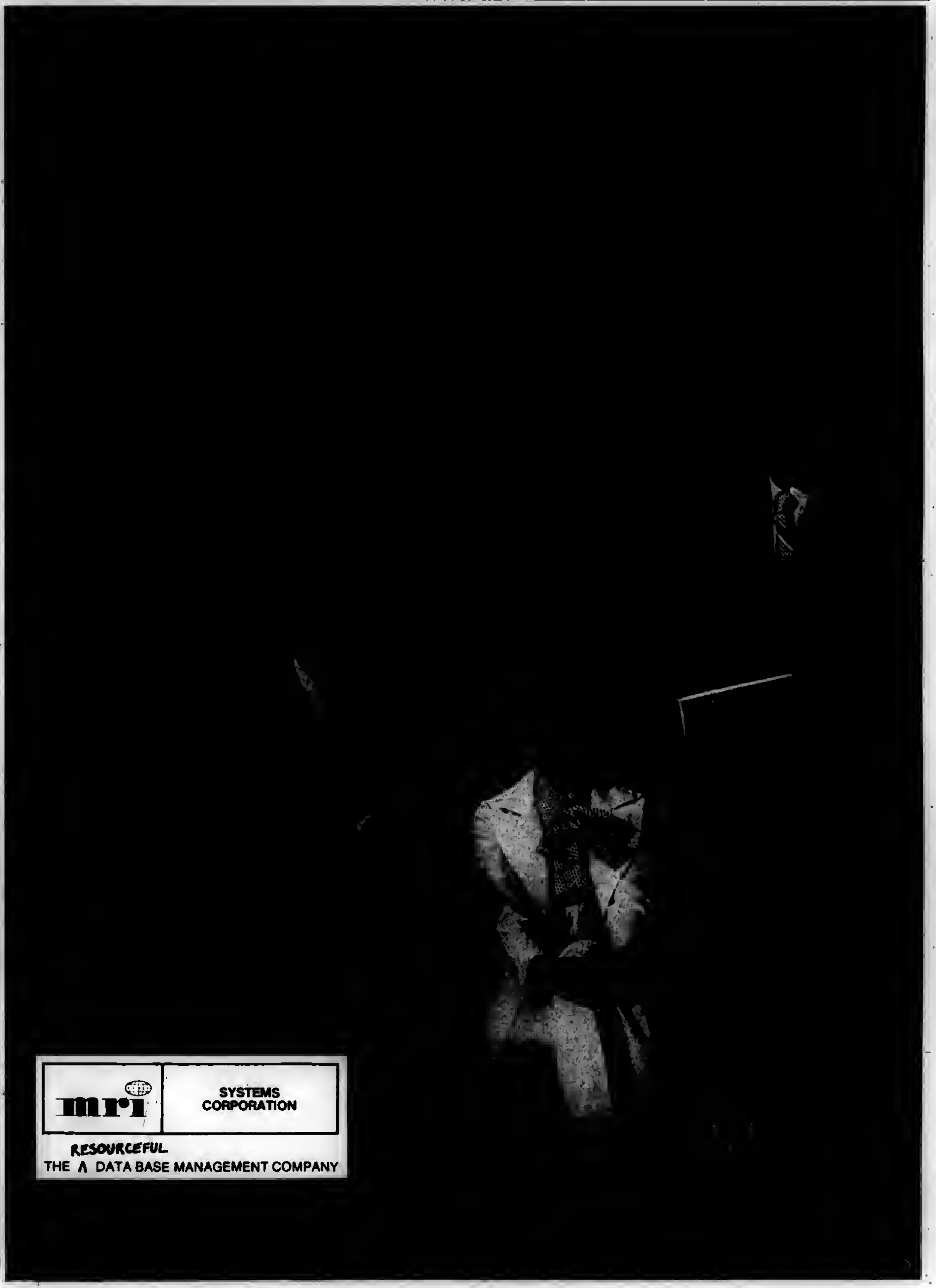
Sequential processing lacked flexibility while index sequential didn't permit accessing the same data from different directions or independence of data from processing. The company felt NCR's Total could solve its various problems, he said.

La-Z-Boy needed a system which was fast, accurate and flexible. Data base techniques dovetailed to meet these requirements, he noted.

Smoktonowicz added any company which is thinking about adopting a data base system should ask itself the following questions:

- Is independence of the data from the processing logic important?
- Is random access desirable because there are few inputs compared with the master file sizes – or for any other reason?
- Is accuracy crucial, indicating reference to supporting transactions rather than summary counters?
- Do you want this system's design to be independent from the design of future systems – or vice versa?
- Is it necessary to access a logical group of data from different directions and for different reasons while protecting the integrity of the data?
- Do you want a single transaction to undergo all validations and updates within one input "READ"?

If the answer to one or more of these questions is "yes," data base techniques should be considered, Smoktonowicz said.



Mini With Access to 370 Backs Long-Range Planning

(Continued from Page S/10)

opment for line operations assumes the processing will be routine, the data base relatively stable and applications constant, these elements are highly unpredictable in a planning environment and require a different, much more flexible system design.

The first step in the CPIS development – which was done by Kim Johnson, an independent consultant under contract to the SPO, was the formulation of basic concepts, evaluation of needs and constraints and setting up a project framework.

The system designers formulated an operational plan, evaluated existing systems for transportability and identified the central file software to be used – National Military Command System Information Processing Formatted File System (Nips).

The next step was operational system development, modification, initial testing and the acquisition of the initial data, software and hardware components. Operational tests of pilot projects were performed for municipal, regional and state agencies.

These projects included unemployment studies, housing surveys, flood damage assessment, revenue estimation, industrial development, map production and many others. The projects required a variety of data, processing techniques and I/O options so that all major system components were tested in a live environment.

Hardware Components

There are three groups of hardware components in the CPIS, each located in a different area. The Eclipse at the SPO has 128K bytes of core memory, a 10M-byte disk, 300 line/min printer, 1,600 bit/sec magnetic tape unit, 400 card/min reader, teletypewriter operator's console and CRT with keyboard.

The IBM 370/158 is located at the Department of Highways. The SPO is now making arrangements to link the Eclipse to a Honeywell 6080 at the state computer center as well.

The SPO also has access to a third hardware group – digitizers, plotters and map production facilities – through arrangements with other agencies.

Although the hardware components are located in different areas, this approach eliminates duplication of existing equipment, expertise and other state resources, thus saving considerable expense.

Software for the Eclipse includes Fortran, RPG II for report generation, Hasp workstation emulator for communications to the IBM system and the Infos data management system.

A variety of packages is available throughout the whole system, including Nips software, the Statistical Analysis System (SAS), Polyvert for land use mapping and an econometric software package (ESP).

Equally important to CPIS is its data. There are currently four permanent files: land inventory, soils inventory, population and housing census and economic status. Other major files include employment and unemployment, industrial development and public assistance. Minor files vary from time to time.

"Gathering all this data required coordination with and cooperation on the part of agencies," Mayer said. "First we had to identify what we needed, then write programs to extract and reformat the data so it would be compatible with our other holdings," he added.

A key part of CPIS is the subsystem which gives researchers an up-to-date list of all holdings in the state planning library. The catalog of all resources – books, pamphlets, periodicals, studies, maps, photographs and microfiche – is stored on the Eclipse system. Infos allows entries to be accessed by author, title, code number, Library of Congress number or subject.

Access is on-line through the system's CRT and a hard-copy bibliography is printed out periodically. The library system is structured so that it can become a pilot project for a possible future data directory of all holdings in the state.

Going Data Base?

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- 10:45-12:00 – Panel – The Data Base Future: DBTG, relational, distributed or?
- 12:00-1:30 – Luncheon/Speaker: Leo J. Cohen: The Impect of Data Base on Management's Business.
- 1:30-4:00 – Four Concurrent Sessions

SESSION 1
Review of the Packages;
Review of IMS, Total, IDMS, S2000, ADABAS, DATACOM

SESSION 2
Service Analysis;
Data Base System Requirements Definition

SESSION 3
Data Base Administration;
The DBA – Roles, Methods and Structures

SESSION 4
Distributed Systems;
Mini Computers and Distributed Data Base

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Relational Approach Adapts to User's Aims

(Continued from Page S/10)

perienced mathematicians, were decidedly 'turned off' by the terms 'ntuple' and 'domain,' " words labeled "confusing and ominous terminology" at another point in the paper.

"Replacement of these terms by 'row' and 'column' greatly expedited communication with new users," they added, in what is surely the understatement of the entire paper.

From simple thoughts, it is relatively easy to lead new users into understanding that in addition to a table being a repository or collection of data it also represents relationships among the data items in that table, the paper continued. Once that understanding is achieved, the "rows" and "columns" of data can be put into new tables, providing new insights into the relationships of the items.

To illustrate this point, the authors noted that one of the areas in a personnel data application in which the relational operators "proved very useful" was in input data validation. "By looking at large clumps of data and groupings items together in various ways, many errors were isolated.

"These validation procedures were not carried out before because of the effort required to write and debug computer programs" developed in conventional ways, they added.

As useful as the relational operators appear to be, however, Joyce and Oliver acknowledged that the graphical and statistical adjuncts to Regis – "which could have been built into any conventional data base packages" – were sometimes seen by users as even more valuable.

Regis contains performance monitoring facilities which continuously record various phases of its operations for the usual purposes of locating inefficiencies and predicting performance as a function of command sequences and data base sizes. The monitoring information is stored in normal Regis sets and thus can later be analyzed from a variety of perspectives.

Concern over efficiency of a generalized approach such as Regis "is still justified," the authors said. However, "use of the system does eliminate the traditional specialized programming effort. We feel this savings has greatly offset any execution inefficiencies" in Regis itself.

Jury Still Out

Memphis Schools Ponder Wisdom of DBMS Acquisition

By Betty Stanley
And Jack Merrill
Special to Computerworld

In the fall of 1972 the Data Processing Division of Memphis City Schools decided to use data base. This was one of the most difficult and thoroughly debated policy decisions the division has faced since the decision a decade ago to acquire an IBM 360.

Has the experience justified that decision or has the effort been more trouble than it is worth? The jury is still out on a definitive answer.

There are now 10 files in DL/I format and 300 programs which work with them. The main motivation was to make changing and adding to files less costly in programming.

Six people work on maintaining 1500 Cobol programs. The demand for their services could keep at least 12 people busy. The effort involved in converting to DL/1 is adding to the work of the maintenance team.

What is not so easy to measure is how much maintenance (and evolution of small improvements) is less costly because of the files and programs which now use data base. A comparison of the present structure of several major files with their original data base design indicates the flexibility is advantageous.

Film Schedules

In the fall of 1974 computerized film scheduling was begun for the Division of Instructional Materials. An average of 560 films, with peak loads as high as 1500, are scheduled daily via a TCI 277 CRT attached locally to an IBM 370/135. (There are five additional TCI 277s and one TCI 275 on-line simultaneously running various inquiry and data-entry applications.)

The film records are stored on a DL/I film master file. This file is composed of a root segment which contains the title for each master film number, one print segment for each copy of the film in circulation, a description segment for each line of the film description and subject segments denoting cross reference information.

Inquiry to the film master causes scheduling information for an entire calendar year to be displayed on the terminal. Scheduling for additional prints of the film can be displayed by depressing a specific key.

Films are requested by completing a preprinted requisition form or by telephone. The master film number, school code, teacher name, use dates preferred and the number of days desired are indicated. The person requisitioning the film is also encouraged to give "not before" and "not after" dates (a range of dates) marking acceptable alternative use dates.

This information is entered on the terminal and the least utilized copy of the desired master film number available on or nearest to the preferred date is booked for the number of days entered, plus one day for delivery, one for pickup and one for cleaning and rewinding.

The DL/I film master file is updated on-line and a detail transaction is logged to disk for each film booking or extension. If none of the copies of a master are available within the given range of dates, the terminal operator is notified and a rejection record is logged to the disk transaction file.

Requests Confirmed

At the end of the day, this disk transaction file is used to print teachers' confirmation reports which tell them when to expect delivery of the film and when it must be returned. This report also informs the teacher if the desired film was unavailable within the specified range of dates. These reports are sent to the teachers daily.

The file is then merged onto a year-to-date transaction file and the disk space cleared for use during the next day's on-line scheduling. The year-to-date transaction file is used to print daily film delivery and pickup tickets and yearly utilization and rejection reports by school and by film. This enables the Division of Instructional Materials to more effectively assign video equipment among the various schools and determine which films need more copies in circulation.

A film catalog has been printed from the film master file. A tape copy of the DL/I film description and subject cross reference file was input to an RCA photocomposer.

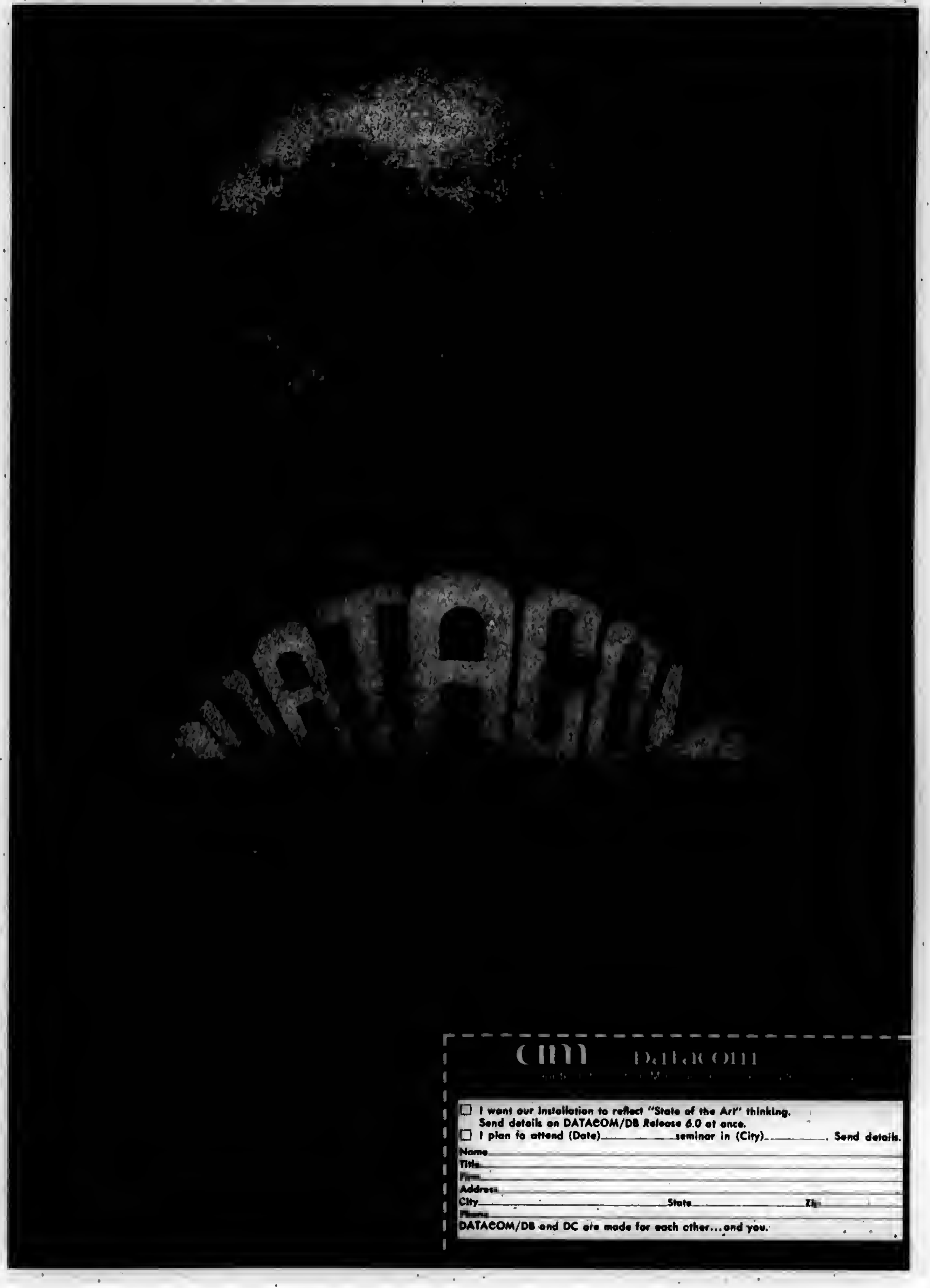
All changes, additions and deletions (including damaged film handling) to the film master are presently being done in a batch job environment, but a feasibility study on providing on-line capability for these jobs is being carried out. All of the software for the film scheduling system was written entirely in house.

In the spring of 1975 there were several requirements which forced a file change in the student master file. After much debate about how to handle these, the decision was made to convert the file and programs to DL/1; the system has been working well for more than a year.

There are advantages and disadvantages to data base. The advantages of data base address the disadvantages of more conventional file to program to device relationships. For those who do not plan to invest much in conversion or program maintenance in the next two to three years, the data base advantages would be less significant. The Memphis schools justified data base in part on the basis of minimizing future conversion costs, regardless of whether they are caused by hardware changes or by systems improvements. The DP division was afraid that DOS/VS and data base would significantly degrade throughput through extra overhead and paging. These fears have not materialized.

There is still much work to be done. All new files are being implemented in data base format and the expectation is that all major files will ultimately be changed to DL/1.

Stanley is a system software programmer and Merrill is director, computer division, for the Board of Education in Memphis, Tenn.



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Univac Software Backs Ohio System

By Glora Baram
Special to Computerworld

The Northwest Ohio Regional Information System (Noris) is an on-line comprehensive Criminal Justice Information System (CJIS) for law enforcement, court and correction agencies in this part of the state. The system runs on a Univac 1100 using TIP/CMS and Univac's data base management system, DMS-1100.

Noris tracks offenders from the issuing of a warrant, through arrest and court proceedings until it becomes a criminal history.

It also interfaces, through Ohio's Law Enforcement Administrative Data System (Leads), with the National Criminal Information Center (NCIC) and the National Law Enforcement Telecommunications System (NLETS) for querying vehicle information and message switching nationwide. Furthermore, the Noris CJIS contains "enhancements" such as soundex, alias names and numbers and weighted search.

Integrity and Security

The system is also designed to provide the integrity of data and security expected from a regional CJIS.

Several modules of the system were transferred from other operational systems in the U.S. under a special grant from the Law Enforcement Assistance Administration which is studying the feasibility of transferring applications rather than "reinventing the wheel" [CW, June 18, 1975].

While the Noris data base is rather complex by its nature, the system was developed and transferred in one year at a cost of about $700,000. The staff at Noris feels this was accomplished because of the DMS-1100.

Baram is deputy director of the Northwest Ohio Regional Information System.

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Problems in IMS Implementation Solved by Insurance Company

By Gaylord E. Smith
Special to Computerworld

COLUMBUS, Ohio — In the past three years, Nationwide Insurance, with home offices here has experienced rapid growth in the use of data base/data communications systems.

The first data base was loaded in June 1973 using Cincom System's Total and Environ/1 as data base/data communications software. Increased complexity and growth of applications resulted in a conversion to IBM's IMS/VS in September 1975.

The current size of the Nationwide data base is summarized by application in Figure 1. The processing of auto and homeowners policies is decentralized, resulting in 12 data bases which are identical in structure. Nearly all are Hidam with secondary indexes. There are no logical relationships.

Currently under development are applications for a claims processing system and a tape library control system.

While things are moving forward reasonably well, there have been several specific problem areas worth noting:

1. Free Space Distribution. This is a difficult problem in IMS/VS data bases. It is important that record keys be designed such that new record additions are distributed evenly across the data base. This was accomplished by loading policy files in terminal digit order. The final three digits in the key are swapped with the initial three digits.

2. Data Base Recovery. Using the image copy/change accumulation facilities within IMS/VS for backup and recovery was too slow. We currently use Innovation Data Processing's Fast Dump Restore (FDR) package and the IMS/VS log tape recovery facilities. All data bases are backed up to tape once a week on Sunday nights.

We have also found we need two ways to recover data base on-line update activity. One way is log tape recovery. In addition, all applications which do on-line updates write user records to the log tape. These records can be used to recreate this on-line activity in a batch mode. This latter technique is a "safety valve" to be used when log tape recovery is not possible because the data base has been altered.

3. Concurrent On-Line and Batch Update. The BMP facilities of IMS/VS are the only facilities for batch updating a data base which is also being updated on-line. If the on-line CPU is running near capacity, the running of a batch job on the same CPU can severely degrade on-line response time.

We have found it necessary to isolate data, in a separate data base, if our plan is to update this data on-line. Specific records must be updated either on-line or in batch mode. They cannot be updated by both batch and on-line concurrently, unless the on-line CPU has excess capacity.

Smith is director of Regional Systems at Nationwide Insurance, Columbus, Ohio.

Application	Data Bases	3350 Packs
Auto	12	16.0
Fire	12	5.0
Life & Health	4	6.0
Commercial	3	.3
Personnel	1	.3
Agent	12	.2
Credit Union	1	.1
Data Dictionary	1	.1
Total	46	28 Packs (8.9M bytes)

Figure 1. Data Bases at Nationwide Insurance

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Data Dictionary May Be All Many Users Really Need

By David da Costa

Special to Computerworld

One of the greatest problems in the design of data bases is the accurate prediction of future data requirements. This in turn leads to a confused situation whereby additional data items lead to a disproportionate expenditure of effort and a general degradation both in data base design and performance.

Even successful implementors of data base management systems (DBMS) at some time find it necessary to almost completely revamp the system, to reorganize data and restate the logical relationships between data. (This is exactly the situation that many data bases have been introduced to prevent!)

Because of this, many users who have reached the stage where a redesign is necessary and who wish to avoid the same miserable procedure yet again, have opted to isolate their data base system by means of a data dictionary. This is a software system that handles the management of data, in contrast to the DBMS, which handles the manipulation of the data.

For the same reason more users are implementing a data dictionary before they move into data base systems at all.

With a data dictionary it is possible, having organized the data definitions, for parts of some data base systems to be set up automatically.

Administrative Post

Any DBMS will provide for a high concentration of data which will be shared by many users. Both the concentration and the sharing can produce problems: a new position of data base administrator (DBA) is normally created to manage this new environment.

The DBA can exercise control over the information content of the data bases through the use of the data dictionary. In his security function he can exercise control over the use of the data base through allocation of passwords and access security levels that assign authorizations to use the data.

Because the functions of the DBA pertain to more than the data base itself, the new title of data administrator (DA) has been coined.

The DA, through a data dictionary, can define how the data appears to a user. Through the DBMS he can define how data is stored. This emphasizes data independence, making it unnecessary for users to be involved with the physical data structure of the data base.

Again, it is data relationships which provide much of the power of a data base system. With a data dictionary, the DA has the capability to specify the properties that underlie relationships, and rules to maintain the integrity of values that represent these properties. These in turn permit him to maintain and preserve relationships regardless of technological or other changes in the physical characteristics of data.

Redundancy Reduction

A large part of the justification for a data base – only infrequently fully realized – is the reduction of data redundancy.

Because a data dictionary enables different data definitions for different users to be held against one data item, actual data storage redundancy is avoided even though the data itself may be used in redundant structures.

Data integrity is another significant aim of data base use. Once again, armed with a data dictionary, the DA can monitor storage, modification and the use of data to ensure that the integrity is not compromised. This is because a data dictionary enables him to specify editing, validity and consistency rules.

The independence of the data dictionary enables the data base to be reorganized and rerun as usages, statistics and priorities change – without any disruption to the applications being run.

The disciplines needed to ensure compatibility of use of data by the imposition and enforcement of standards are made available to the DA through the data dictionary, which specifies the intention, meaning and physical characteristics of data.

Because data is kept separated and independent, these standards can be maintained regardless of changes in storage technique and are always aligned with the changing data resource environment.

In addition, use of a data dictionary assists both analysts and programmers in avoiding needless programming and in reducing development time.

Whether a definition is input on-line or in batch mode it need only be input once, regardless of the number of applications which will use it. Thereafter, any control blocks or I/O areas can be automatically generated, with tremendous savings in terms of the clerical effort involved in recoding and repunching cards for each fresh application.

Again, the data dictionary can be seen as an interactive map which tells the DA what data is used where and demonstrates the paths between different items.

With the minimum effort it is possible to create "test" systems from the assembled data definitions. A single definition can be modified to produce a new control block or new I/O code, and a single command is all that is necessary to set up fully documented, usable segments.

It is apparent that the introduction of a data dictionary system will have an effect at many levels in an organization. It will create new tasks, but in return it will reduce the effort required by such activities as systems analysis and design, documentation, coding of programs, creation of test data files and checking and auditing of output files.

Da Costa is managing director of Management Systems & Programming, Ltd., London, England and Cambridge, Mass.

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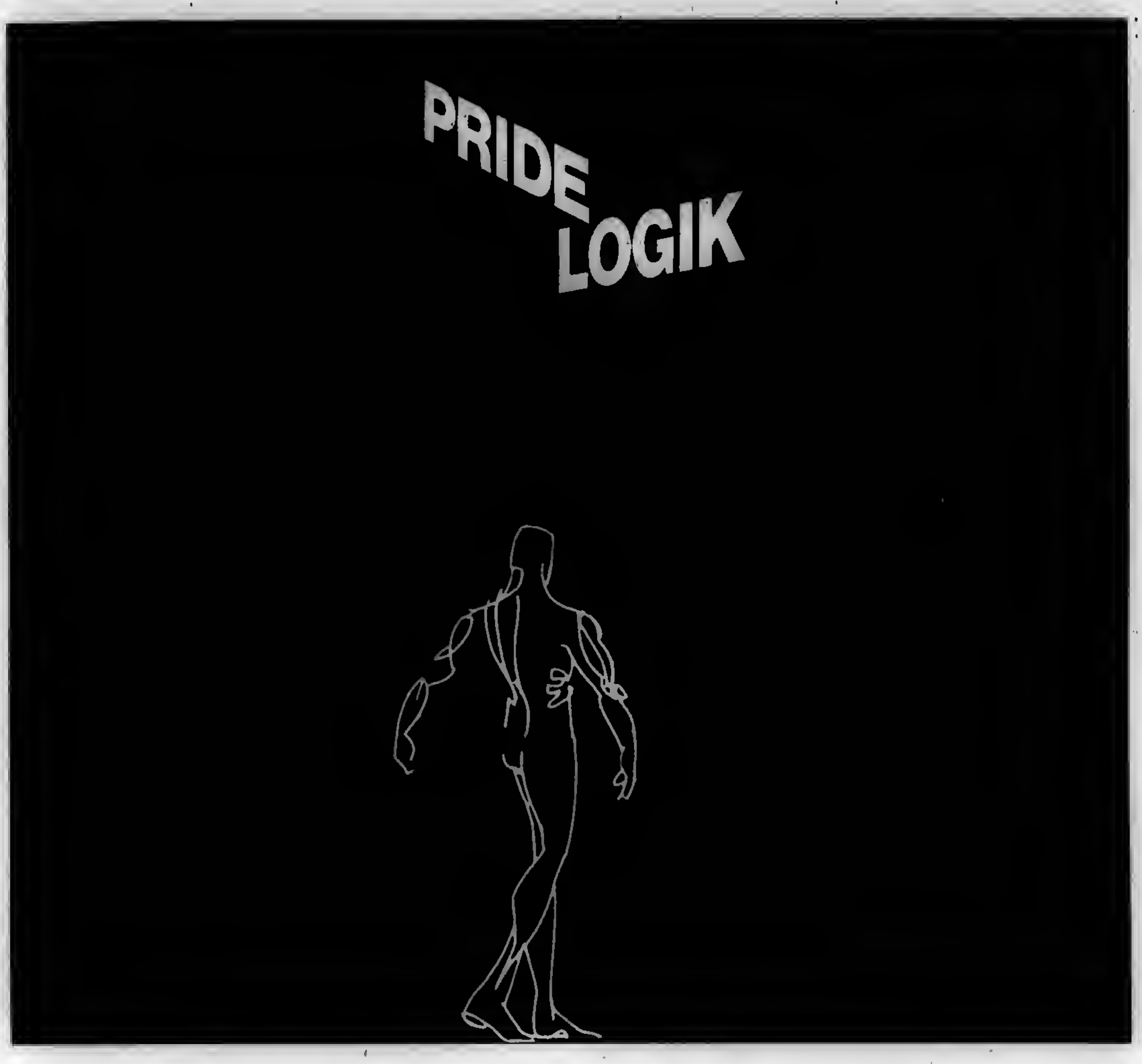

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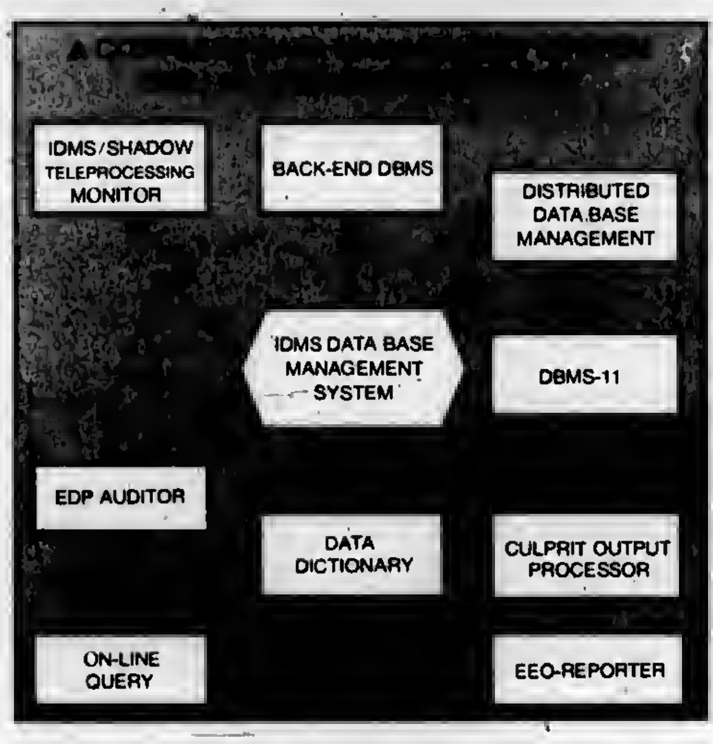
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FEC Microfilm System Records Data on Campaign Finances For Open Public-Access Center

WASHINGTON, D.C. – "I think everyone at the Federal Election Commission [FEC] believes open public access is the key to the success of the campaign finance laws," according to Kent C. Cooper, chief of the FEC public records section.

The FEC, which recently unveiled a turnkey system to monitor federal campaign spending [CW, Sept. 27] is using a microfilm system to get the information directly to the public.

"When candidates and special interest groups know their records are open to the public, they react," Cooper said. "Reporters and opposing candidates can bring inconsistencies and questionable contributions into public view even though they may not be technically illegal."

To provide this open access to campaign finance information, the FEC has opened a storefront public records room in downtown Washington where anyone can view the information in its files.

Help-Yourself Operation

The storefront is a no-questions-asked, help-yourself operation, Cooper noted. "We don't care who comes in or what they're looking for," he said.

"We have four staff people to help the public learn to use the files and cross-check the information submitted. But we never ask anyone for identification or question a person about what he or she is looking for," he added.

Such anonymity is essential to investigative reporters and the staffs of opposing candidates, Cooper stated. But establishing an information system with this degree of open access hasn't been easy, he noted, adding that without microfilm it might have been impossible.

The FEC is legally required to make public all reports it receives within 48 hours. At the close of a reporting period, the FEC may receive reports of varying lengths from thousands of candidates and political groups.

Since it would be impossible to duplicate and file that many documents within 48 hours, the FEC films them with an Eastman Kodak Co. Recordak Reliant 700 microfilmer, which can handle 200 document/min, Cooper said.

The exposed film is picked up by messenger and taken to a processing lab in Baltimore, Md. The film is processed overnight, duplicate copies are made and the microfilmed reports are returned and ready for public viewing early the next morning.

Having the reports on microfilm has eliminated worries about lost, stolen or misplaced documents, Cooper said.

"Can you imagine the uproar that would result if a reporter couldn't find a candidate's report and filed a story that the candidate broke the law, when the report was simply misfiled?" he asked.

"We can guarantee the accuracy of microfilm file. We couldn't with paper records."

Although FEC files contain more than one million documents, a specific report can be located with the aid of a computerized index. Information extracted from campaign documents is fed into a computer which prepares and updates retrieval indexes.

For example, the 1976 Senate candidate index lists in alphabetical order all candidates seeking a Senate seat, Cooper said.

Next to each candidate's name appears information on the type of report filed, the covering period dates and the number of pages in the report along with the microfilm magazine number and the beginning image number for that document, he explained.

There are similar computer-prepared indexes for House and Presidential candidates and for special interest groups and political committees which also are in microfilm magazines.

To find a document, a user inserts the

(Continued on Page 38)

Modularity Provides Key To Itel Advanced Systems

By Esther Surden
Of the CW Staff

NEW YORK – A second look at the Itel Corp. Advanced Systems (AS) introduced here recently [CW, Oct. 18] revealed modularity as a key feature.

The CPU, for example, is microprogrammed to allow future enhancements to the system to be more easily accommodated, Itel said.

An operator has the capability to dial out failing increments of memory, a process Itel claimed can be accomplished with no degradation of processing power.

The CPU also features spare multiplexer channels which can substitute for a failing block or byte multiplexer channel, Itel noted. Thus the AS/4, AS/5-1 and AS/5-3 each feature seven multiplexer channels – six standard and one spare; the AS/4MP, AS/5-1MP and AS/5-3MP each have 14 channels including two spares.

Three Physical Areas

Each AS is divided into three physical areas. The back of the unit contains the power and distribution system, power supply and main storage. In the middle of the system, the logical sections for the I/O devices, storage control unit and CPU are located. The operator area at the front of the system contains the CRT, light pen and 180 char./sec matrix printer.

The light pen is provided "because the systems are IBM-compatible. They have a light pen and so do we. It's used in responding 'yes' or 'no' to a question," an Itel spokesman explained. The CRT also has a console keyboard, he noted.

The service processor is housed within the system console. Operating under microcomputer control, diagnostics are implemented through a floppy disk drive, the company said.

The floppy drive would only be run with field engineers present, the spokesman noted.

Within the system's middle section are air-cooled gates which swing out for service. Each gate has its own air-flow source which continues to operate even when the gates are open, the firm claimed.

Many of the boards, which consist of unpluggable components, have empty space for future expansion, the firm noted. An extra section is reserved for future boards.

The repluggable parts capability means users can keep replacement parts in stock, eliminating the need for "high-cost boards to be stored in remote locations," the company said.

The systems weigh about 63% of their IBM counterparts, require 45% of the power and generate 37% of the heat, Itel claimed. The reduction in weight and power consumption can be attributed to high-density bipolar semiconductors which use emitter-coupled logic, according to the firm.

Upward expandability at the user site is another feature that differs from the IBM systems, Itel said. Users reportedly can upgrade from the smallest system to the largest system without exchanging CPUs.

Customer Service

Customer service for the systems will be provided by a division of the firm. Itel is assuming all hardware and software support responsibility except in the program products area.

Those products which are licensed from IBM should be supported by IBM, the spokesman noted. As far as system software is concerned, Itel is assuming responsibility to get the user's system running if bugs develop in the operating system, he added.

Both hardware and software service will be accomplished through a beefed-up field service force. Itel pointed to its Field Engineering Division with more than 500 trained field engineers and said this will be augmented by system engineers.

Initially the firm expects to provide users with four personnel per system, the spokesman stated. "The overall responsibility for hardware and software will lie with Itel," he said.

When asked what program support IBM would supply, an IBM spokesman stated "programming support for system control programs is provided to IBM customers through the Field Engineering Division. However, field engineering (on a per-call basis) and central programming services are not available when such programs are used on non-IBM CPUs."

Slower Cycle Times

Itel admitted its read/write cycle times are slower on the AS than on the comparable IBM systems, but said this is offset by the systems' capability to fetch 16 bytes at a time compared to four or eight on the IBM systems.

The read cycle times for the AS/4, AS/4-MP, AS/5-1 and AS/5-1MP are 1,035 nsec while the write cycle times are 690 nsec, the firm said. The AS/5-3 and AS/5-3MP have a read cycle time of 920 nsec and a write cycle time of 690 nsec, the company said.

"Instruction time will be equal to or faster than IBM instructions depending on whether the instruction is in microcode," the spokesman said.

The CPU has the same internal features as the IBM 370/158, he added, but with the addition of a prefetch function which speeds up effective CPU times.

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To Prevent Unnecessary Downtime

Fire Detection Methods Crucial to CPU Protection

By H. Lein

Special to Computerworld

A relatively small fire in a computer area can cause a disproportionately large loss of irreplaceable time quite apart from the physical damage done. Lost business and downtime are difficult to justify when modern methods of early warning detection are available to prevent their occurrence.

There are a number of fire detection products for computer rooms on the market. They work on several distinct principles; each has its own variables and its own niche carved out in the field of fire detection.

It is impractical and unwise for a user to decide on a system without looking very closely at the details of the particular situation – from the broad picture of building size and configuration, intended usage, value of building and contents and degree of safety.

Frequently, it may be wise to specify the necessary degree of fire protection and let the equipment manufacturers or distributors prepare their bids, offering the engineered systems and equipment mix they think best to meet the situation.

Fire Hazard Development

A fire hazard may develop when a circuit arcs because of loosened terminals, faulty contacts or circuit malfunctions. Many fires originate from other types of fuel loading such as furnishings, paper, accumulated debris in underfloor areas and draperies. These hazards should be evaluated and treated accordingly.

Because the thousands of electrical components generate heat, large air-handling systems are required to keep the equipment at a constant temperature. Sustained temperatures in excess of 140°F can cause malfunctioning of some parts within the system.

Temperatures over 185°F can permanently damage transistors and diodes. Temperatures from 300°F to 500°F can impair reliability of system units. The smoke and acids produced by fire adversely affect operation of computer equipment and magnetic components.

Fire resulting from an electrical fault can be extinguished by shutting off power to the equipment if the fire has not reached the self-sustaining stage.

Ionization detectors can warn of fire before the computer is seriously threatened and indicate an incipient fire condition by sensing invisible products of combustion: particles less than 39 millionths of an inch in diameter.

Ionization detectors, responding to combustion products, are capable of detecting fire before there is smoke, flame or appreciable heat.

Location of Detectors

The spacing of detectors primarily depends upon the number of minutes per air change, air velocity and the number of return grills.

If the air is introduced into the room through a perforated ceiling, a blanket of air will be created along the ceiling, preventing the combustion products from reaching the ceiling. This delays detection considerably.

In such a case, the holes in the ceiling should be sealed off within a 9 sq-ft area around the detector. This usually has little effect upon the distribution of air in the room and considerably improves detection capabilities in the area.

Air Movement

Where there is a significant air movement along the ceiling, the detectors should not be recessed into the ceiling, but rather surface-mounted on the ceiling to protrude into the area. This is necessary since the air movement along the ceiling in a computer room may cause significant stratification which can prevent the combustion products from reaching the ceiling.

The concealed spaces created by a raised floor and hung ceiling present a distinct fire hazard and also require protection. A qualified technician should examine the area for any significant air movement before suggesting the exact detector coverage required.

Protection should be provided for the ventilation system as well as the general and concealed areas. To prevent the spread of a fire condition, ventilation system fans and fire dampers should be automatically shut down when fire or smoke is detected.

Equipment Protection

Electrical faults cause more large-loss fires (exceeding $250,000) than any other cause. In all fires below this figure, electrical faults figure as the third leading cause of fire loss.

The largest factors in initiating electrical fires are motors, electrical wiring and heating equipment.

Equipment protection as differentiated from area protection means the degree of protection necessary to spark an alarm in specific pieces of equipment in order to minimize damage.

It should be emphasized that placing detectors in a normal manner on the ceiling of rooms containing equipment will not assure warning of minor faults, such as burned out transformers and tape drive motors.

Protecting Enclosed Equipment

Two methods may be used to protect specific enclosed equipment.

Where ventilating air is forced and the velocity exceeds the limits allowable for a standard flush or surface mounted detector, the problem may be considered the same as that for an air-conditioning system.

If equipment in need of protection is not housed in an enclosure, it may be necessary to build one. In certain cases, this may not be practical if the equipment must be regularly maintained or if belts, cables or other working parts make enclosure impractical.

In these cases, it may be desirable to build a hood over the equipment so the products of combustion can be collected

(Continued on Page 37)

Burroughs users! Now you can eliminate your Achilles heel.

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You can rent, lease or buy both the printer and controller. For full information, call or write Joe McDonough, Grumman Data Systems Corporation, 45 Crossways Park Drive, Woodbury, New York 11797. (516) 575-3034. Telex: 96-1430. TWX: 510 221-1842.

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DP Dialogue

Notes and observations from IBM
which may prove of interest to
data processing professionals.

The brass foundry is one of more than 100 separate work zones at Price Pfister monitored by the online production control system.

It's a DL/1 World at Price Pfister

When the Price Pfister Brass Manufacturing Company moved its "chained" data files to Data Language/1 or DL/1 recently, it also moved into a new world of flexibility and economy of operation.

And for the Pacoima, California, company, it was a move that has made a world of difference in controlling manufacturing and distribution operations to help maintain profit and customer service levels.

Price Pfister is a subsidiary of Norris Industries, Inc., and a major supplier to plumbing wholesalers and contractors, with a nationwide network of five regional warehouses. Its catalog of fittings, faucets and fixtures contains some 4,000 finished items—which incorporate 10,000 separately identified parts and subassemblies.

At the company's headquarters facilities, order entry and production and inventory control are handled online by an IBM System/370 Model 145, using 3277 Display Stations for direct entry of orders and shipments. At four remote warehouses, data is entered through 3735 Communication Terminals.

"Under DL/1," says Joel Brust, director of information systems, "we can easily add a new data field or change the data structure in other ways without affecting any of our 1,100 sales and manufacturing programs except the ones that directly use the revised data.

"In our online order processing system, for example," Brust continues, "we can tailor the content and format of the 3277 display to suit our needs. One feature we've added to the system is order inquiry by the customer's own order number as well as by name; this has proven to be very helpful in getting the right answer to the customer, fast."

DL/1 will enable Price Pfister to maintain a complex file structure that relates every finished item to all its parts and subassemblies, and—in the other direction—each inventoried part to all the finished items on which it is used. DL/1 is an IBM program that organizes such "chained" files, and permits user programs to access the data through a simple interface.

Price Pfister converted to the 145 in October 1975, and at that time started to shift its chained files from DBOMP (Data Base Organization and Maintenance Processor) to DL/1. "The 145 easily handles DL/1 and teleprocessing under CICS/VS (Customer Information Control System/Virtual Storage)," Brust says, "and the increased capacity permits us to do material requirements planning and production scheduling on a weekly cycle, rather than on a monthly one.

"The online system continuously tracks some 11,000 items of work-in-process inventory through 100 work zones. By revising the production schedules weekly, we've been able to hold down inventory imbalances and avoid uneven loading of the work centers. Switching to a weekly cycle enabled us to cut work-in-process inventory by six percent."

Putting the Computer Where the Users Are

Interactive computing is making data processing and problem-solving power directly accessible to end users and programmers alike. End users can engage in personal computing to solve specific business, financial, engineering, design or similar problems. DP professionals can work interactively for faster creation and testing of programs.

And with facilities now available from IBM, interactive computing is easy to use, powerful in developing solutions, and adaptable and economic to implement.

End User Computing

For the end user—the financial planner, engineer, marketing specialist—personal computing provides simple procedures for using the computer to solve spur-of-the-moment or one-time problems. Each user gets his results promptly at his terminal.

A financial planner can make cash flow projections. A marketing man at a terminal can structure a new type of sales analysis for a sales program. An engineer can solve an equation or try alternative approaches to a design problem, working creatively and interactively with the computer.

A computation can be of any size. Applications which are too small to put through the program development cycle may be entirely feasible when implemented directly by the user.

For the user who wishes to solve unique problems, three user-oriented IBM languages are easy to learn and simple to use at a terminal (see box). And a constantly growing set of IBM prepackaged interactive programs supports such applications as economic analysis, simulation and modeling, statistics, forecasting, project management and data base access.

Developing Applications

For the programmer, interactive computing provides a new level of productivity. He can submit programs for test directly and receive results back promptly. Working interactively, he receives immediate indication of any coding errors rather than, as in the past, waiting to obtain a test run.

DP managers have found that interactive application development has greatly increased productivity. At Playtex Inc., for example, programmers who had been putting an average of seven lines of code per day into final form were able to produce 70 final lines a day. This significantly shortened application development time, and the resulting programs proved more reliable and easier to maintain.

Use of interactive computing by professionals throughout the organization relieves the programming staff of work which users can now do for themselves, and greatly reduces the cost of developing small or occasional-use programs.

At the same time, this use of personal computing frees programmers to focus on more demanding, production-oriented applications. Similarly, computer operators are relieved of queuing the unscheduled jobs, which users can now enter directly, and of delivering printouts of results which can be received directly at the terminal.

With interactive computing, the organization and its people make use of the full power of multiprogramming. Professionals can access the system simultaneously without interfering with ongoing batch or scheduled work. Programmers can increase productivity. And both can develop new approaches to the computer and better understanding and use of its potential.

IBM Facilities for Interactive Computing

Three IBM languages are designed specifically for problem-solving under Virtual Storage Personal Computing (VSPC):

1. *VS BASIC.* Powerful, yet simple to use, it is adaptable to a wide range of business and general applications.
2. *VS APL* is a broadly applicable interactive language particularly well suited to the creation of business and commercial programs.
3. *VSPC FORTRAN* is an interactive version of FORTRAN, the established language for mathematical and scientific programming. It is designed specifically for use under VSPC.

Professional programmers using IBM interactive computing under the Time Sharing Option (TSO) or the Virtual Machine/Conversational Monitor System (VM/CMS) for application development may work in any of the standard IBM programming languages: COBOL, PL/I, FORTRAN, APL, RPG II, or Assembler.

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New Techniques Aid John Hancock Programmers

Two years ago, John Hancock Mutual Life Insurance Company became one of the first users of the Improved Programming Techniques. Now it is reaping benefits in more orderly application development, program quality and maintainability, lower development costs, and schedule adherence.

"We find the six techniques to be synergistic," says Robert C. Volante, vice president for systems and programming. "You get the most benefit by introducing them early in program development—at the level of analysis and design—and all together."

Using the techniques, each development step is a group operation rather than an individual activity. One of the techniques is *Team Operations*, under which a project is organized into groups, each with a chief programmer, a backup programmer, and a team librarian who keeps track of source code and manages documentation.

During *Top-Down Development*, detail program design and coding proceed from the top or control portions of the program down to the finest levels of detail. Under *Structured Programming* certain architectural forms are adhered to in writing the program, making it more regular in form and simpler to read and interpret.

A program is developed as a group product, "publicly owned" rather than proprietary to individuals, by conducting *Structured Walkthroughs:* formal group procedures for verbally analyzing and validating programs and modules.

"You see the real beauty of these methods when a specification change pops up half way through a major project," says Volante. "When the customer asks for a change, we can rapidly find every affected point in the system with a look at our HIPO diagrams and structured code." *HIPO* (Hierarchy plus Input-Process-Output) *Documentation* is used to describe small, functionally defined modules, serving first as a tool for design of the program and then as permanent documentation.

"Our users are happier too," Volante says. "One, after attending a structured walkthrough, told us: 'Now I understand what I'm getting before the system is installed.'"

Notes Nancy Bern, director of EDP education: "The intrinsic discipline of the walkthrough," she adds, "prevents errors. People get oriented to doing the job correctly."

The *Development Support Library* and the team organization, Bern says, relieve programmers of clerical work, making better use of their time.

"When IBM presented the techniques to us in early 1974," Volante says, "there was an intuitive reaction here that this addressed important issues for us.

EDP education at John Hancock is directed by Nancy Bern (right), assisted by senior instructors (left to right) Cindy Gasik, Jack Grady, Ted Pierce and Dan Steele.

We started people through the two-week IBM course on the techniques, and launched three pilot projects.

"Two of the projects are now complete," Volante continues. "In spite of the 'learning curve' effect, they were finished within our time and cost estimates. But the real benefits came in testing and maintenance. With top-down design and programming, integration testing proceeds in parallel with development. We find that our systems are better tested, and that new programs run correctly from the start.

"About 60% of our programmer-analyst time goes into maintenance," Volante says, "and the techniques are especially helpful there. Programs are easy to read and people have little trouble picking up one another's work.

"Once people get accustomed to the methodology," he adds "they don't want to go back. We've now trained 200 EDP people and more than 50 end users, and the people who haven't been through the course yet are eager to go. Now we've moved up on the learning curve, and projects are beating their schedules."

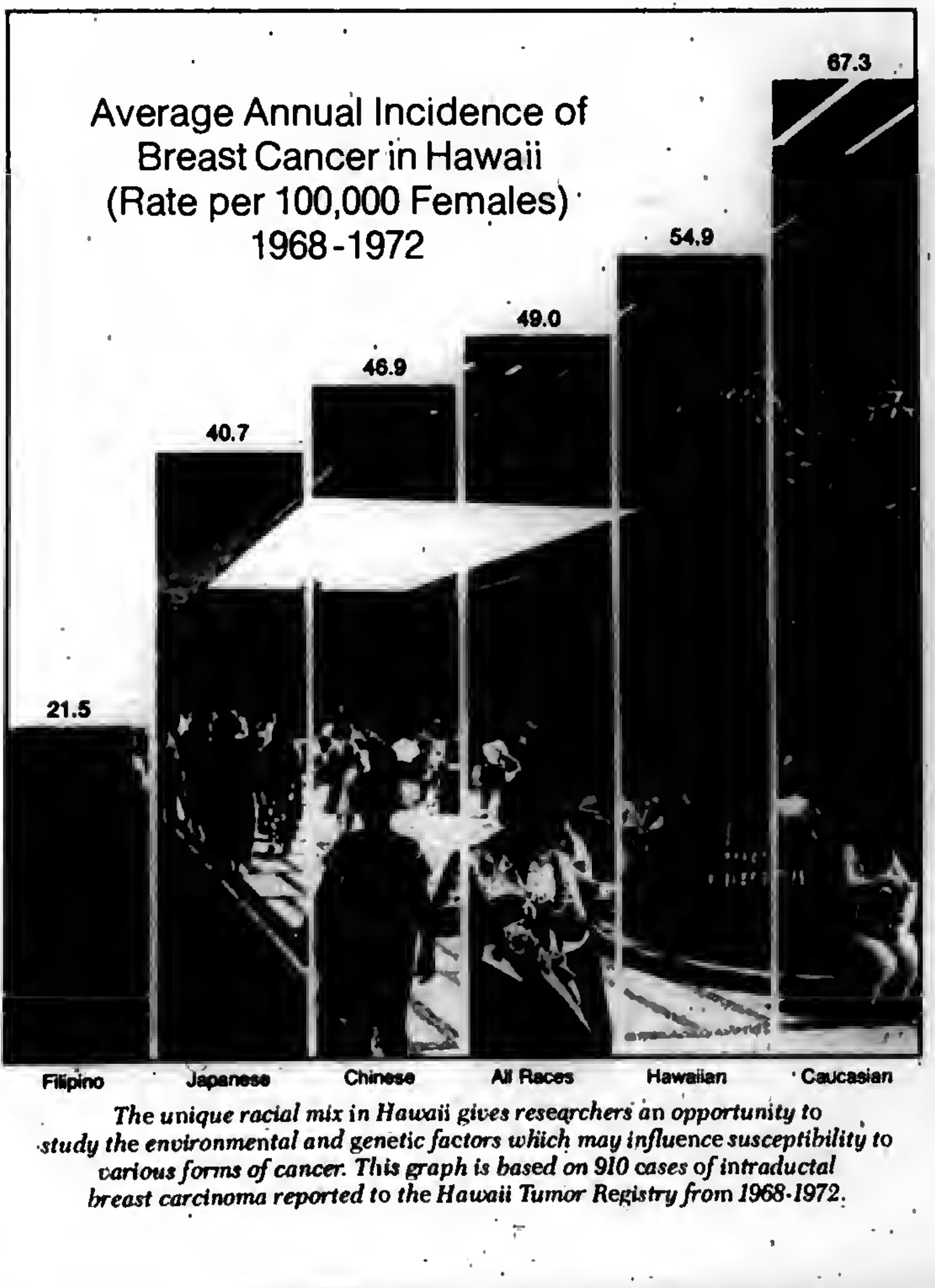
There are about 12 projects in various stages under Improved Programming Techniques, he says, including a very large online system. "Our efforts have really paid off," he asserts; "we won't turn back."

Computerized Data Base Aids Cancer Researchers in Hawaii

Is there any relationship between a woman's height and weight and the possibility that she may contract breast cancer? Or between racial origin and the tendency to get a specific form of cancer? Could diet or occupation have any influence on a person's susceptibility to cancer?

These are all questions currently being researched at the Cancer Center based at the University of Hawaii. Scientists and doctors trained in a wide range of disciplines including biology, chemistry, genetics, epidemiology, biophysics, immunology and virology are studying the correlation among many factors which may be related to causing cancer.

The Center, funded largely by the National Cancer Institute, maintains a large computerized data base stored in the University's IBM System/370 Model 158. It includes information such as the birth and marriage records and ethnic backgrounds of over 200,000 families living in Hawaii.



The unique racial mix in Hawaii gives researchers an opportunity to study the environmental and genetic factors which may influence susceptibility to various forms of cancer. This graph is based on 910 cases of intraductal breast carcinoma reported to the Hawaii Tumor Registry from 1968-1972.

Many Factors Involved

"We begin with the belief that there is more than one condition which can influence susceptibility to cancer," explains Dr. Lawrence H. Piette, Director of the Cancer Center. "These conditions may include exposure to or the presence of a specific virus, the existence of a particular carcinogen in the environment and/or a genetic predisposition to the disease. Any one of these factors alone will not necessarily cause cancer, but in combination they are more likely to increase the probability the disease may occur."

Hawaii provides an excellent "laboratory" for studying cancer because of the unique racial mix of the population. Data collected by the Tumor Registry program, part of the state's Department of Health, indicate that the seven major racial groups in Hawaii—Japanese, Filipino, Chinese, Korean, pure Hawaiian, part Hawaiian and Caucasian—have different incidences of cancer at different ages, despite the similarity of environment.

Heredity or Environment?

"We want to determine the relationship between the environmental and genetic factors in connection with the disease," says Dr. Piette. "For example, we know that the incidence of breast cancer in Japanese women who have migrated to Hawaii is higher than for those who have remained in Japan. On the other hand, the propensity of the offspring of Hawaiians of Chinese ancestry to get a rare form of cancer called nasal pharangeal carcinoma seems only slightly affected by environmental change. In both cases, we'd like to find out why, now that we have identified broad correlations."

For instance, the data base has been used to test the validity of the hypothesis that women who are taller and heavier relative to the average for their race show a higher risk of getting breast cancer. First postulated by a team of Dutch researchers, this theory appears to be substantiated for the women whose records form the Hawaiian data base. However, Dr. Piette cautions that simple correlations only tell part of the story. Many other factors, such as the age of a woman during her first pregnancy and her estrogen profile, may also be very significant in determining susceptibility to breast cancer.

"We were fortunate that Hawaii already had good record keeping programs," says Dr. M. P. Mi, a geneticist and director of data communications. "Our goal now is to incorporate additional kinds of data such as blood type and fingerprints. Most people aren't aware that fingerprints can help determine racial origin, a significant fact in a population with extensive intermarriage.

"Most of our work is still in the preliminary stages," comments Dr. Mi. "As we move into multivariate analysis—correlating many factors—we will be able to get increasingly specific results. We feel our work can help develop hypotheses which can be followed up in later studies. The more we know about the disease, the better our chances will be for earlier diagnosis by identifying high risk groups and, in many cases, effecting cures."

DP Dialogue appears regularly in these pages. As its name suggests, we hope DP Dialogue will be a two-way medium for DP professionals. We'd like to hear from you. Just write: Editor, DP Dialogue, IBM Data Processing Division, White Plains, N.Y. 10604.

IBM.
Data Processing Division

Installing Fire Detection Units Can Prevent Wasted Uptime

(Continued from Page 34)

and directed to the detector.

In most cases, equipment which develops a fault sufficient to alarm the detector should be automatically stopped or deenergized. The control equipment provides terminal contacts for this purpose.

In some types of equipment, it may not be practical or safe to provide automatic cutoff; therefore, the desires and advice of the user should be considered.

With electrical fires, the smoldering fire continues up to the "self-sustaining point" only by virtue of the electrical energy being supplied.

Therefore, if the system has been designed to detect the incipient fire (such as in direct equipment protection), extinguishment can usually be provided simply by automatically shutting off power to the equipment upon alarm from the detector.

Automatic Extinguishment

In cases where the system is not designed for incipient fire detection or where the possible fuel for a fire would not be extinguished simply by turning off the equipment, automatic extinguishment systems may be desirable.

These systems can be of three types:

- Automatic discharge on alarm from the detector.
- Automatic discharge by an independent heat detection system.
- Manual discharge.

These systems can be carbon dioxide flooding, halon flooding, sprinklers, etc.

Ionization, infrared and photoelectric detectors are early warning devices and, as such, could respond to a fire still in its early stage before the extinguishing system must be discharged. In such cases, portable extinguishers can be used.

'Cross-Zoned'

In order to avoid, as much as possible, the tripping of the extinguishing system except when desired, Pyrotronics, Inc. recommends the use of a "cross-zoned" system. With this arrangement, the area is protected so two separate zones in alarm will activate the extinguishing system. The detectors are alternately spaced in the area.

Protecting a computer with an early warning system means more than merely installing a series of ionization detectors. To operate effectively, ionization detectors must be installed properly – in a correctly designed system; and know-how for system design takes experience.

Lein is a fire protection engineer with Pyrotronics, Inc. in Cedar Knolls, N.J.

'Laser Beam Systems' Focus of Seminar

CHICAGO – "Laser Beam Information Systems" is the topic of a three-day seminar at the University of Chicago starting tomorrow.

Subjects to be covered include "Adapting Lasers to Usable Information Systems" and "Characteristics of the Laser in Information Systems," in addition to applications sessions, a university spokesman said.

The seminar costs $395 per person plus a $50 registration fee, the spokesman added from 1307 East 60th St., Chicago, Ill. 60637.

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Computer systems fail because people do.

Solving the People Problems of EDP Management is a new, two-day seminar that will help you be a better DP manager.

NOTE: Only one seminar before '77 budget time—don't miss it!

Some problems erode the effectiveness of your data centers from the inside. And they're not part of your computer. They're part of your people. The human relations conflicts that surround your operation can sap management time, erode employee confidence, alienate the executive staff, diminish DP productivity — and leave you stuck in the middle. Jack Stone, PhD, has developed a new seminar that's designed to help you improve the performance of your computer center by increasing your ability to communicate with people — from keypunch operators to the board of directors. Its called *Solving the People Problems of EDP Management.*

The Course Work

Using case studies, interactive discussions and workshops, this two-day seminar examines the human relations conflicts that commonly affect most computer centers, and presents strategies and techniques for resolving them.

The seminar is intended to give each attendee a new and practical understanding of the aspirations and motivations of computer professionals. It is designed to help DP managers communicate more effectively with senior management, and develop more positive relationships with end users and other people outside the data center. This includes the development of a "public relations" program for DP center, with the object of increasing end users' understanding of how the computer center can help them in their jobs.

Here are just some of the things you will learn:

- How to improve performance among operations personnel, despite typically poor attitudes.
- How analysts and programmers have a different view of their jobs than management, does and how to handle the resulting conflicts.
- How to replace "management by crisis" with "management by plan."
- How to increase the people-productivity of your DP center and thereby make it more useful to your entire organization.
- The pros and cons of structured design and programming management techniques.

Jack Stone, PhD, is the Seminar Leader

Jack Stone, PhD, is managing director of Computer Education International, Inc., and is recognized for his abilities as an author, educator, and consultant to EDP managers. A Phi Beta Kappa graduate from Princeton University, Dr. Stone has been involved with computers and electronic systems for over 23 years, including 8 years as a Manager at IBM, where his responsibilities included development of Instructional Systems, as well as management of a DP center; and 7 years as a principal in several independent firms supplying management consulting and training services to large computer centers. He is a member of ACM, DPMA, AMA, and the American Society for Training and Development. Dr. Stone has contributed many articles and columns to *Computerworld* on the subject of EDP human relations, and presented a paper at NCC '76 on "ADP Training Systems." He is currently preparing his first book for publication, which deals with human relations in medium-to-large computer centers, and these works will form the basis for the extensive materials you'll receive in the course.

Charges and Enrollment

The charge for the entire 2-day seminar including continental breakfasts, luncheons and all course materials is $295* per registrant. Additional registrants from the same company get a $35 discount, and pay only $260*. This does not include hotel rooms, if necessary, but we have reserved a block of rooms at the seminar hotel for attendees who wish them. To enroll, look over the schedule below, fill in the coupon and send it in. Remember, enrollment is limited and no space can be firmly held until we have received check or purchase order.

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* This seminar is also available for private, in-house presentations. If you have several people who could benefit from this training, it may be cost-beneficial to have Dr. Stone present the seminar to your staff exclusively (the seminar can be tailored to your specific needs).

☐ Check here for more information

Customer Checks Banked in 24 Hours

On-Line Cash Application Perks Up Firm's Cash Flow

By William E. White

Special to Computerworld

BROOKLYN, N.Y. – A typical customer at Peerless Importers, Inc. here makes purchases four times a week. He sends us a check every week that may cover all or some of what he bought that week, include prior purchases and reflect discounts, charge-backs and other factors.

That check is just one of more than 2,400 we receive every day from over 15,000 customers in the metropolitan New York area. It is banked within 24 hours of its arrival – and probably the same day it is received.

The capability of efficiently handling this heavy cash flow is provided by a computer-based system developed specifically to meet our requirements. The productivity of accounts receivable clerks handling this work has been greatly increased, customer relations have been significantly improved and, in financial terms, the system paid for itself in the first year of operation alone.

To our knowledge, this is one of the first on-line cash applications anywhere. Three clerks at terminals linked on-line to an IBM 370/135 handle a workload that previously occupied seven people and frequently saw incoming checks held up from three to seven days before they could be banked.

A significant amount of money is being saved in interest charges for money that would otherwise have to be borrowed to finance our accounts receivable.

Peerless Importers, founded in the early 1940s, is one of the largest liquor distributors in New York. Over 300 salesmen service customers out of four divisions: Peerless, Alpine Wine & Liquor, Webster Lawrence and Ferrara Wine House.

A mechanized warehouse adjacent to the company's office stocks between 5,000 and 6,000 items, assembling shipments and loading trucks overnight to fill the 2,100 orders that come in every day.

Peerless' experience with DP dates back to 1950, when an IBM 403 accounting machine system was installed. Computer operations began in 1963 with a 1440, upgraded successively to a 360/20 and 360/22.

Replaces Stuffed Trays

The cash payments application problem began to build up in the early 1970s. Incoming checks were stuffed in trays with punched cards representing bills outstanding.

Cards and checks were pulled and manually compared for multiple payments, discounts and credits. The seven clerks worked overtime every night, almost every Saturday and even on holidays on which there were mail deliveries.

Despite this effort, checks did not get to the bank until at least two days after receipt – and in some cases not for seven to 10 days.

Since we could find no ready-made program package for an on-line cash application, we contracted with IBM's Systems Engineering Services to develop it for a one-time fee. We estimated three clerks would be needed, each working at an IBM 3270 CRT terminal.

This original projection was met, and on-line cash went into operation in September 1973. A fourth terminal was added later in the credit department to answer customer inquiries and to make fast credit checks.

Adding Machine Control

The 370/135 includes disk units with 174M bytes. Housed in these units is an accounts receivable data base with all open bills by customer number, date of delivery and amounts due.

As the checks with bill stubs come in, they are batched in groups of 20 or less, and an adding machine total is run up as a control figure. The batches go to an accounts receivable clerk who enters the customer number into the terminal.

The clerk then enters the amount of each check in the batch and the control figure. If these do not agree, the system does not accept the entries and the clerk has to correct the error before continuing.

Once the information has been accepted, the system applies the cash payments in those situations that can be handled automatically – when the check is for a single invoice, a single statement or when it covers all open bills in the file.

After all batches are entered and the payments that can be handled automatically are applied, the clerk is left with those situations that require intervention. A batch number is entered, and the first check that was not resolved appears on the screen. The system also lists all of that customer's open items.

The clerk scans the list of items to find any combination of two or more that may add up to the amount of the check. The clerk touches each open item with a light pen; the system adds them and shows the total and any difference between that total and the check amount.

In this manner, the clerk interactively resolves any partial payments, chargebacks, returns or credits.

White is DP manager at Peerless Importers, Inc.

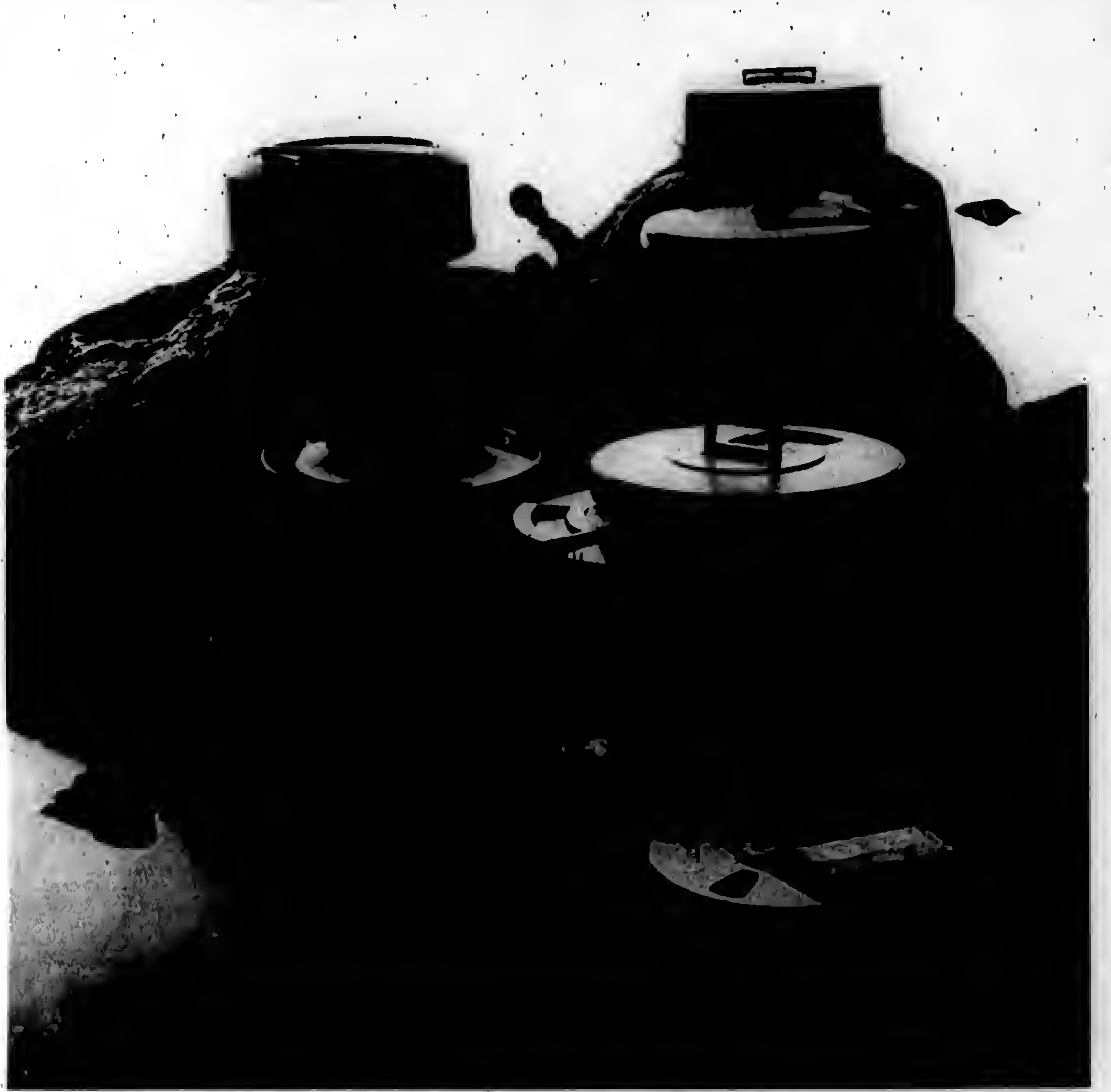
Microfilm Operation Gives Public Access To Campaign Data

(Continued from Page 33)

appropriate microfilm index in a Recordak Microstar reader/printer, finds the name of the candidate or committee and notes the microfilm magazine and image number for the desired report.

The user then inserts the proper microfilm magazine, keys in the frame number on the image control keyboard and pushes a search button; the document automatically appears on the screen.

At the push of a button, the user can get a paper copy of the document to take away and, at the same time, the microfilm file remains intact for the next researcher, he noted.



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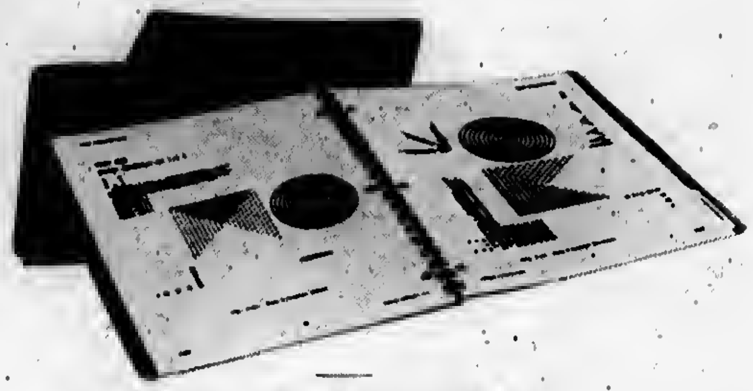

The 4662 contains its own character generator, alpha rotation, and page scaling, thus minimizing support software. Proven graphic and plotter software is provided by Tektronix.

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It's the first B-sized plotter with graphic input. Digitizing capability and built-in joystick mean you can input corrections in seconds, experiment with designs, and run off camera-ready copies practically as fast as you load paper.

It's plug-to-plug compatible with virtually any RS-232 system . . . from minis to mainframes. You can plot circles around any other B-sized plotter, for about the same price as the competition.

Want immediate action on the 4662? Call toll-free: (800) 547-1880.

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Mini Bits

West Coast Conference Set For Home Systems Users

WOODSIDE, Calif. – What may be the "first West Coast Computer Faire" concerned with both personal and home computers will be held in San Francisco April 15-17.

The Faire is being cosponsored by a variety of organizations including the San Francisco-area chapters of the Association for Computing Machinery, some personal computer clubs and some educational institutions.

The conference portion of the Faire is expected to offer some 100 tutorials, informal presentations, formal papers and discussion sessions. The exposition will feature a variety of "homebrewed" personal systems and low-cost components.

Suggestions for speakers, topics, papers, exhibits and special activities should be directed to Jim Warren, Faire Chairperson, Star Route Box 111, Woodside, Calif. 94062.

Century Series 400 Expanded

CONCORD, Calif. – Century Computer Corp. Series 400 business systems can now accommodate 512K of MOS memory rather than the 64K previously available, according to the company.

The expanded memory circuitry can be added to systems already in the field for $1,500 and is available on current systems for $1,000, the firm noted.

Memory modules in 32K increments cost $7,500 up to 128K and $6,600 thereafter, a spokesman added.

The expanded memory systems were designed for heavy multiprocessing and on-line/real-time applications, he noted from 2339 Stanwell Circle, Concord, Calif. 94520.

Adapso Plans New Jersey Seminar

NEWARK, N.J. – A two-day seminar sponsored by the Association of Data Processing Service Organizations (Adapso) will "review the opportunities available to data centers as a result of the small business computer" on Nov. 9-10 here.

The seminar will cover a basic introduction to minis and small business systems, types of vendors, business problems that can be solved by the small systems, implementation and how to get into the business and stay in, a spokesman said.

The seminar costs $110 for Adapso members; and $200 for nonmembers. Information is available from Adapso at 210 Summit Ave., Montvale, N.J. 07645.

In Trying to Get Files On-Line

Fingerpointing Vexes Mixed-Vendor Site

By Esther Surden
Of the CW Staff

YELLOW SPRINGS, Ohio – Cooperation was definitely not the keyword when a mixed-vendor shop here with an IBM 3/10 attempted to get all of its files on-line, according to its assistant DP manager, Keith Swigart.

Yellow Springs Instrument Co., Inc., a medical electronics manufacturer, has a 3/10 with 8K bytes of IBM memory, 40K bytes of Business Systems Technology, Inc. (BST) memory, a 200 line/min IBM 5203 printer, four IBM 5444 drives with 2.5M bytes each, two BST 5445 drives with 20.48M bytes each and a 250 card/min reader.

The system is running Cincom Systems, Inc.'s Total data base management package.

The problem began when the firm, which runs simple accounting functions on the system, found it was constantly changing disk packs because all the files could not be kept on-line, Swigart said.

"When we set our files up, we set them up so each of the applications that had a related file was a [separate] file. Consequently, we've run out of file space. We have in the vicinity of 125 to 150 files and are still growing," he explained.

"Most shops using a small system try to work with the 2.5M-byte disks. We did too in the beginning, but we saw it was taking too much time to change packs to run different jobs," he said.

"Our reaction was to say, 'We're wasting too much time each day on pack changes. Why don't we try to put all our programs in one library pack and all of our files on one file pack?'

"Then, whenever we wanted to run a program, all we'd have to do was run the program.

"Only it didn't work that way," he recalled.

Vtoc Limitation

Yellow Springs bought the two BST 5445 disks and changed all its files over to the disks – and then found out there was a 50-file Volume Table of Contents (Vtoc) limit for the 3/10, Swigart said. A 3/15 can handle a 1,000-file Vtoc on the same disks, he indicated.

Swigart called IBM and was informed a 1,000-file Vtoc could not be accommodated by the 3/10 because the system handled data differently than the 3/15.

IBM also said the limitation was noted in the system manual, but Swigart and his staff have yet to find it, he said.

Swigart then got in touch with the IBM regional supervisor. The supervisor gave him the number of the president of Common, a small systems users group, and told him Common was accustomed to handling such problems, Swigart said.

The conversation with Common resulted in Swigart being pointed to a package from Group 3 called Extend which he said "goes in and modifies the supervisor; [the vendor] didn't tell us it was going to change the supervisor."

Trying that package was disastrous for the firm, he added. "Odd things kept happening, like we'd lose a record in the middle of a run or a record would pop up out of sequence."

The "solution" brought the system to a crashing halt – "We were down and couldn't process anything. The files just weren't there."

So Yellow Springs called IBM back and said it was having trouble with the supervisor. While IBM admitted there might have been a problem with the supervisor, it also pointed out Yellow Springs was running another vendor's software on the system, he said.

The firm also called the software vendor, which claimed all the other Extend packages in the field were working well and the problem had to be in the IBM

(Continued on Page 42)

BSP Has Multiterminal Systems For On-Line, Interactive Users

IRVINE, Calif. – The Adviser systems introduced here recently by Business Systems Products, Inc. (BSP) were designed to span the range from first-time user applications to sophisticated distributed processing, according to a company spokesman.

The two multiterminal, on-line interactive hardware/software systems can be operated by a firm's existing personnel, BSP said. The Adviser II and Adviser III systems provide interactive retrieval, data entry, updating and reporting and can communicate to a larger CPU through protocol emulation, the spokesman added.

Users can upgrade from one system to another by adding memory and peripherals; all software is compatible, he noted.

The basic Adviser II includes a CPU with 64K bytes of core memory, a four-port terminal multiplexer, 10M-byte disk drive, CRT utility table and 100 char./sec matrix printer.

The system operates under the Adviser Virtual Memory Operating System (Avos) which supports 24 interactive applications, a batch utility, communications emulator and two spool-to-printer tasks.

Adviser II is programmed in the Adviser Business-Oriented Language (Abol), a Cobol derivitive, the spokesman noted.

The Adviser II can be expanded to accommodate up to four disk drives with a total on-line storage capacity of 32.5M bytes. A multiplexer extension module allows the four asynchronous RS-232 communication ports to be expanded to eight ports.

The system can accommodate up to 24 interactive terminals, each with its own printer, the company claimed.

The basic Adviser III configuration includes a 64K CPU, eight-port terminal multiplexer, one 80M-byte disk drive, one CRT, a utility table and a 165 char./sec matrix printer as well as the Avos operating system.

A maximum of eight disks can be accommodated by the system; after the initial four drives, another controller is required.

Two printers can be attached directly to the system.

The eight RS-232 ports can be expanded to 24 with extension modules, BSP said. Memory can be expanded to 304K bytes with a memory expansion feature, but the first 16K bytes of additional memory is reserved for system diagnostics, the firm noted, and is not available for use under the operating system.

The system also provides synchronous transmission which requires one SC-100 communications facility attached to an RS-232 modem.

Emulators available include IBM 2780/3780, 360/20 Hasp workstation, IBM 3 workstation, Control Data Corp. 200 UT, Univac DCT 2000 and International Computers Ltd. 7020.

The minimum Adviser II configuration costs $38,400; a 10M-byte disk drive costs $10,900 and the multiplexer extension module is priced at $2,800.

The basic Adviser III configuration costs $65,800; an additional 80M-byte disk drive is priced at $19,900 while the multiplexer extension module for this model costs $4,600.

An additional 16K bytes of memory for the Adviser III costs $3,500, as does the memory expansion feature. The synchronous communications facility costs $4,000 while remote job entry emulation for the IBM 3780, for example, costs $1,500.

BSP is at 2121 Campus Drive, Irvine, Calif. 92715.

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PRIME

In Search for More Flexibility

Mini Bumps Large Mainframe Out of School's DP Room

By Esther Surden
Of the CW Staff

KLAMATH FALLS, Ore. – A "modern" minicomputer has bumped an IBM 1130 system from the computer room at the Oregon Institute of Technology (OIT) here to allow the school additional flexibility in academic and administrative functions, according to Frank Vaskelis, director of the computer center.

"We simply ran out of computing power on the 1130. The system was being run by students almost round the clock and would only accommodate one user at a time," Vaskelis said.

The mini was picked through the established Oregon state bidding procedure, he reported. Two southern Oregon schools got together to replace the 1130s and issued a joint request for proposal to 30 vendors; only Hewlett-Packard Co., Digital Equipment Corp., Prime Computer, Inc. and Harris Corp. responded to the bid.

The systems then were put through a technical evaluation, benchmarking, and financial analysis and a Harris system was chosen because it "performed the best in all three categories," Vaskelis said.

Although academic programs are all up and running on the system, which was installed in June, the school is still in the process of converting some of the programs from the 1130. "The Fortrans are compatible and Cobol reasonably compatible, making for a fairly easy conversion," he noted.

For administrative tasks, the school is planning to tie the system into a network of state college computers, Vaskelis said.

"We are currently building an administrative and academic computing network in the State of Oregon tied into a Control Data Corp. Cyber 73 system at Oregon State and a Honeywell 66/40 at the state Data Services Division," he explained.

Communications via IBM 2780 line protocol between the 66/40 and the Harris and via UT200 to the Cyber system are expected to take place. The Harris system will then be used as a remote job entry terminal to the larger systems in an integrated central student information system, Valkelis said.

The system includes a Slash 7 CPU, 192K bytes of memory, an 80M-byte disk, 600 card/min card reader, 300 line/min printer, CRT console, one 9-track 800- and 1,600 bit/in. tape drive and a communications multiplexer. It cost the college about $160,000, Vaskelis said, adding the school has a third-party lease.

Every student at OIT is required to take at least one computer programming course before graduation, Vaskelis noted, so the system gets a lot of work. The student body has a population of about 2,300.

Maintenance for the systems has been "exceptional," Vaskelis said.

"I can anticipate that if we have a problem, the engineer will be here within an hour, dependent only on if he has been called out to service the other school's system," he said.

Fingerpointing Plagues Ill. Site

(Continued from Page 41)

software.

IBM told Swigart it would come in to work on the parts of the system untouched by the non-IBM software. Therefore, the only solution was for the firm to keep a copy of the system program at system generation time and to install temporary fixes while retaining the original program, the assistant DP manager recalled.

Back to Original Vtoc

The next step was to absolve all the other vendors except IBM, so the firm had to reconvert to the 50-file Vtocs without the Extend package, a process which it completed of necessity within a weekend, Swigart said.

IBM then came in to help straighten out the supervisor, which was still misplacing files, he noted.

But things are finally looking up for the firm, even though it is back where it started with a 50-file limit. It is faced with an upgrade to a 3/15 to get the 1,000-file limit it needs, but the upgrade would have come pretty soon anyway, Swigart said, because the firm plans to put some interactive on-line applications on the system and the 3/10 is "very inefficient" in that regard.

The 3/10 was not intended to support 1,000 files, an IBM spokesman commented. In order to do so, the user would have to go in and modify the control program to detrimental effect.

As Ohio's Auditor of State, [illegible] auditors oversee [illegible] tough job. But thanks to [illegible] tough than it used to be.

And a lot less costly, too.

The team helped the Auditor's Office select, set up, and train operators to run a computerised record keeping operation based on the Inforex System 5000.

This mini-computer based system replaced a keypunch operation where cards had to be punched for coding and sequencing in order to access information. It was a costly and time consuming operation.

But now, with the pre-programmed Inforex system, file data can be retrieved, created, updated and deleted from a number of different locations. Which means a closer watch over the state's money. And a sizable savings in cards, paperwork and time.

System 5000 is presently being used for a number of different tasks. Updating all physical property inventories and land records, for example. And most importantly, progress checks of audits.

System 5000 has proven so flexible and so easy to use (non-technical staff quickly learned how), the Auditor's Office has plans for lots of other applications. Like maintenance schedules for state-owned equipment. A land file based on deeds, not just reports. And personnel and payroll files.

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Automation Need Not Be Painful for First-Time Users

Special to Computerworld

Although larger businesses automated all or parts of their DP operations long ago, there are about 500,000 small businesses in the U.S. that have yet to install their first computer system. About 315,000 of them are in the retail, wholesale and distribution sector.

Many users have shied away from computers – even though they can easily afford them – because of stories about the difficulties some companies experienced in adjusting to new ways of doing things imposed by the computer.

Painful computerization is a symptom of something wrong. Either the software is inappropriate for the purpose or it is a case of shoehorning an operation into a proprietary "prepackaged" system which is not quite appropriate because it does not allow the businessman to run his business as usual.

When, however, the computer system and the software programs are designed to fit the particular requirements of a company, computerization can be quick and totally painless.

Small business computers and programming technology are now sophisticated enough to adapt to, rather than force changes on, a business operation.

By designing the computer system to individual requirements, the user not only saves money in the long run, but also can convert from manual to computer operation more smoothly. Operation becomes more efficient.

The First Steps

Once the decision to automate has been made, those responsible for the daily operation and fiscal management of a company should outline in specific details the benefits expected from automation.

Usually included in such a list will be time and manpower savings, better control of overhead, coordination of inventory and supplies with customer demands, more accurate and timely accounting and billing, more effective fleet maintenance schedules, improved cash flow planning, reduced overhead, better route planning, expansion plans, etc.

Once expectations and objectives are clear, the user should discuss the ideas with an expert in the field who could be a computer analyst.

After a thorough study of the user's operation and way of doing business, the analyst can tell where computer automation can best and most easily fit, give a ballpark idea of costs and help decide whether leasing or purchasing a system outright is the best way to go.

The analyst may even inform the user that some things he wants computerized can be maintained better and less expensively as they are done now, while other operations could best be converted through customized computer programming or by programs available in standard packages.

Functions such as accounts receivable, payroll, sales analysis, customer billing and general ledger are the things that should be tackled first and can be done the quickest.

What type of computer should a first-time user get? There are many small business computers designed for use by companies doing between $500,000 and $50 million in sales.

A consultant can help select five or six computer companies to consider. When contacting these companies, the user should describe his requirements – the things he wants computerized – and ask for a list of users, preferably nearby, as references.

Users talking to the hardware manufacturer should look for these things:

- Every manufacturer has several alternative software packages to offer with his machine. Make sure these programs are flexible enough to be easily upgraded and enhanced if the business expands or becomes more complex.
- Discuss the types of mistakes that occur most often in the business and make sure proper controls for them can be built into the system right from the start.
- Understand how the vendor's software package fits the operation and how extensively the software package must be modified. As little as a 10% modification of a standard application package may make it more economical to have a completely customized program prepared.

Programming the Computer

Once the choice is made as to which business computer system or hardware is wanted, the user should watch out for the "expert" who offers to automate the business for less money than a reputable software supplier or computer manufacturer. This expert may not be a bargain in the long run.

The expert may be undercapitalized. There have been cases where this bargain-basement programmer had to go out of business in the middle of a project, leaving his customer with a large service bill and an incomplete program that someone else had to start all over again.

The established software supplier can provide:

- Backup computers to help the firm over peak-load periods when the company's own computer cannot handle the volume but a larger computer would be uneconomical for the rest of the year.
- Off-premise storage facilities where an extra set of tapes or disks can be kept.
- A guarantee for the effectiveness and correctness of the developed program and a staff of trained specialists that can upgrade or alter it when necessary.
- Financial stability.
- Documentation and education.

Users should make sure they are involved in every step of the programming phase of computerizing their businesses. Users who are will not find the computer a strange, complicated machine but a simple tool to help conduct the business.

During programming, the user should:

- Insist the programming be done on the software supplier's computer. Why have an expensive computer stand idle for one or two months while the programmer sets it up?
- Make sure the printout forms meet specific needs and are approved for content, ease of reading and comprehension.
- Personally approve and test every program as it is written into the software system. Waiting until the entire job is finished and then deciding to make changes is expensive.

Teaching and Documentation

It is also important to have the software supplier teach all those on the staff who will work with the computer. Top officials may be familiar with how the computer works, but the people who must enter and retrieve data every day must be well-versed in the operation of the machine, as well as familiar with the underlying operating principles and the general software system.

In addition to instruction, the vendor should provide complete documentation on the system and programs in the form of flow charts and operating manuals that will serve as written instructions on how to manage any application written into the system.

Finally, the user should keep those old manual records in an off-premise facility. He may need them after an emergency, such as a fire or flood.

And the user should also keep both manual and automated business procedures going simultaneously for a few weeks as a cross-check on the accuracy and dependability of the programs and of the operators. This may be somewhat time-consuming or expensive, but it is only for a few weeks and it always pays to be safe.

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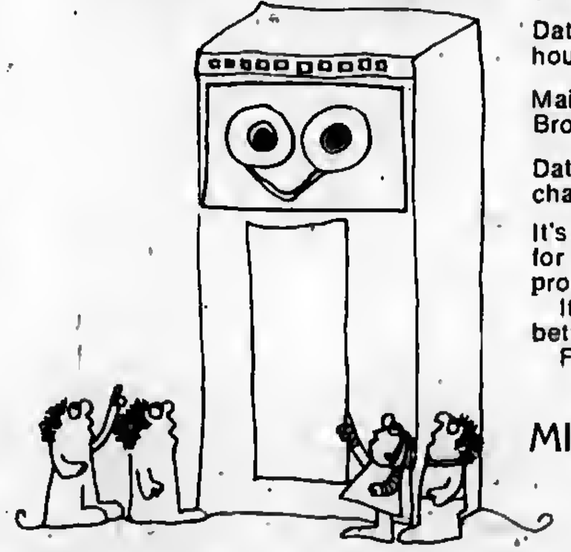

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CI Notes

TRW, Singer Complete Maintenance Transaction

LOS ANGELES – TRW, Inc. has assumed maintenance and customer support of the Singer Business Machines (SBM) Division's North American operations.

Leonard McKenzie will head a new unit responsible for TRW's point-of-sale (POS) systems, the financial terminals business acquired from Financial Data Sciences, Inc. and service responsibilities for the Singer POS terminals and the Singer System Ten computer base, acquired earlier this year.

As of April, TRW's Communications, Systems and Services, (CS&S) Division had 65,000 terminals, including over 4,000 POS terminals, installed. Singer's installed base of POS terminals was over 60,000.

In addition, CS&S' Financial Systems Division had installed more than 7,000 terminals.

As part of the completion of the transaction, TRW has offered employment to more than 2,200 SBM employees. These will supplement about 300 CS&S service employees.

Amcomp to Supply Amdahl

SUNNYVALE, Calif. – Amcomp, Inc., formerly Data Disc, Inc., has landed a contract with Amdahl Corp. for its 8400 disk drives and its 8010 controllers.

Under the 17-month contract, orders for $244,000 worth of equipment have been released to date, according to Thomas P. Quinn, vice-president of marketing.

Supershorts

Bunker Ramo has signed four distributors for its Bank Control System 90 and Branch Terminal System 2000 outside the U.S. They are Vermon Kantoomachines N.V. in The Netherlands; Besscorp of San Juan, Puerto Rico; Datacom S.A. of Caracas, Venezuela and Dataprep Ltd. of Hong Kong.

– – –

NCR will handle international sales for Quantor Corp.'s 115 minicomputer-controlled computer output microfilm recorder/processor and 205 high-speed vesicular microfiche duplicator.

With New Pricing Policies

Can Mainframers Maintain Profitability?

By Molly Upton
Of the CW Staff

The new pricing structures embraced by many mainframers and the likelihood of more mainframe announcements by IBM within the near future is causing some observers to question the long-term profitability of the computer industry.

The increased pace of activity in the mainframe area – marked by memory capacity extensions, price reductions and CPU performance enhancements – appears to indicate the mainframers have taken up the challenge of IBM's new pricing scheme effected in its 370/138 and 148 [CW, Oct. 11].

But while the dwarfs are running toward the cover of the lower price umbrella, some of them have chosen not to take shelter.

And those who have managed to squeak under it have found they have lost much of the price advantage they formerly had compared with IBM's 370/135 and 145, if one takes a CPU with 1M byte of main memory as the means of comparison.

The IBM move has analysts speculating the 138 and 148 may be only part of a forthcoming rapid fire of new CPU announcements that could wear out the soles of the competitors' running shoes as they attempt to match the pace.

"Given the industry's competitive structure and the continued dominance of IBM, will the returns on capital in the longer term for the other manufacturers be adequate to justify their continued high rates of investment in this industry?" a consulting firm's report asked.

In the short run, the reduction in purchase prices by other vendors should encourage heavier shipments of purchased rather than leased machines, thus compensating for the possible narrower margins, the report observed.

However, in the longer term, IBM's announcements signal "a shift in the industry's pricing structure that could reduce the inherent profitability of the business," according to the study.

IBM previously set the tone, and the umbrella, by its pricing structure that maximized long-term returns. Pricing is becoming more competitive, however, because IBM's pricing power has been eroding as users become more sophisticated and more numerous alternatives such as plug-compatible memory, peripherals and mainframes have arisen, the report observed.

In its introduction of the 138 and 148, IBM took the unprecedented step of offering improved performance at a lower price, reducing the purchase/rental multipliers to roughly 40 compared with the over 50 times average for the 135 and 145, and giving its four-year Term Lease Plan a 9% discount from Monthly Availability Charges, according to the report.

Analysis

These actions seemed aimed at "thwarting the plug-compatible memory and emerging plug-compatible CPU competition" as well as "bringing price elasticity to bear on the intermediate systems marketplace," the report observed.

The price/performance improvement to be gained from going from a 135 to 138 or 145 to 148 is essentially on a par with that available in a sideways move between the 360 and 370 series, according to Jim Peacock, editor of *EDP/Industry Report.*

Shrinking Differentials

Taking a look at shrinking price differentials, sources indicated other mainframers' systems were offered at prices typically 20% less than IBM's 135 and 145 before the 138 and 148 announcements.

A look at the current purchase prices on a CPU and 1M byte of memory shows that while Univac's 90/60 offered a savings of $114,604, or 19%, over a 135, this

(Continued on Page 47)

Proposed A-76 Addition Brings Heated Reactions From Agencies

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. – The Office of Management and Budget (OMB) has proposed procurement rules that may force government DP users to favor commercial services even if they cost more than doing the same task in-house, spokesmen of several federal agencies have complained.

DP suppliers with government contracts to gain, on the other hand, are claiming the proposal leaves loopholes that will permit federal agencies to avoid compliance.

The rule under comment is a supplement to Circular A-76, which details the conditions under which agencies can acquire DP equipment and services [CW, Oct. 18].

Since August, OMB's Office of Federal Procurement Policy has received 40 written and two telephoned responses to the proposed policy directive, according to William D. Russell, deputy assistant administrator for logistics.

Of great concern to the agencies was the size DP staff they would be permitted to keep in-house, the letters indicated. Without trained staffs, the departments of Treasury, Transportation (DOT) and Labor (DOL), the Federal Trade Commission and the Federal Home Loan Bank Board doubt their ability to select or properly manage out-of-house service contracts, they said.

Also of concern was the effect cutting back in-house installations would have on federal DP employees. One agency recommended asking for Civil Service Commission guidance in this area.

Several agencies with in-house systems to lose argued the supplement to A-76 should have concentrated on contracting services for new applications and systems rather than those already in place and operating.

Others said OMB wasn't giving them enough time to review in-house systems and their alternatives by setting a deadline of Sept. 30, 1977 for these studies.

Existing government sources should be relied on before the agencies turn to commercial DP sources, others pointed out. DP equipment acquisitions under $50,000 should be exempted from review and approval under Circular A-76, another suggestion recommended.

If OMB didn't deal with minicomputers, turnkey systems and federal DP service centers like those run by the General Services Administration (GSA), the Department of Agriculture and the Department of Health, Education and Welfare

(Continued on Page 45)

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Government Agencies Worried About A-76 Supplement

(Continued from Page 44)

(HEW), its DP procurement policy would be applied unevenly and unfairly, others said.

Others feared commercial services prices would skyrocket once agencies had dismantled their DP operations.

Many stated they couldn't begin to make cost comparison studies of commercial services without comprehensive guidelines; seven agencies said they will look to OMB for such guidance.

The Department of Housing and Urban Development asked for standardization of the length of system life, fair market values of facilities and the salvage value of equipment, in particular. DOT wanted to know how to go about depreciating DP equipment.

The GSA was concerned commercial firms wouldn't go into any detail in their proposals unless actual bids were requested.

The State Department said agencies will need time "to allow potential contractors to demonstrate their competence and efficiency with small applications before entrusting them with vital agency systems."

The 13 agencies supporting the measure as proposed tended to be the smaller ones that satisfy their DP requirements through low budget allocations and often on the systems of larger agencies.

Russell noted, however, the two phoned responses also backed the measure and they were from the Department of Agriculture and HEW – agencies with two of the largest computer installations in the Federal government.

Twenty-nine additional responses, including letters from 23 agencies, five suppliers and one congressman – Rep. Jack Brooks, who chairs the House Government Operations Committee – provided the office with extensive commentary on omissions and errors.

The Computer and Business Equipment Manufacturers Association (Cbema) agreed that a mix of in-house and contracted services would be the best approach to DP in government and that contracting out for services should be as "cost-justified" as any in-house approach.

The firms and their representatives generally concurred with the agencies that comprehensive cost comparison guidelines need to be developed and that any discussion of what an outside contractor might provide would have to depend on more than the services an agency needed performed.

Computer Sciences Corp. (CSC), Control Data Corp. and the National Council of Technical Service Industries sought to stifle their chief competition from government in-house systems and the "service bureau" agencies by calling for A-76 review and approval of all upgrades in addition to those for replacement equipment.

CSC suggested OMB require agencies to publish the results of their cost-comparison studies in the *Federal Register* and allow industry time to react to their needs. CSC would also have OMB come down hard on user agency "excuses" that acquiring outside DP services would delay programs and hamper missions.

Memorex Admits Payments Abroad

SANTA CLARA, Calif. – Memorex Corp. has disclosed that certain of its subsidiaries made "commission-type" foreign payments totaling $577,000 over a period of five and a half years.

The internal investigation did not discover any evidence of "improper payments in the U.S., any political contributions domestically or internationally, any type of slush funds or secret accounts or any underpayment of U.S. taxes," a company spokesman said.

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From Jan 1, 1971 through June 30, 1976, "commission-type" payments of not more than $504,000 "appear to have been made by or on behalf of certain foreign subsidiaries of the company to low-level non-elected foreign government officials or to employees or representatives of foreign customers to facilitate foreign sales."

In addition, payments totaling about $73,000 appear to have been made by or on behalf of certain foreign subsidiaries of the company to low-level non-elected foreign-government officials "to persuade them to perform their required functions."

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Earnings Top $1.7 Billion

IBM Posts Record Net in Nine Months

ARMONK, N.Y. – While IBM turned in record third-quarter and nine-month earnings with increases of 18.5% and 23% respectively over the year-ago periods, the quarter's total ranked only third in record quarters for the firm.

IBM's third-quarter earnings totaled $586.9 million, which failed to match the $592.8 million in the preceding second quarter and the $588.6 million in the 1975 fourth quarter.

Revenues rose 9.9% in the quarter and 13.7% in the nine months from the year-ago periods.

Chairman Frank T. Cary reiterated his statement that "it appears unlikely the quarter-to-quarter rates of growth over the prior year can be sustained for the remainder of 1976 because of the record amount of outright purchases of DP equipment in the final quarter of 1975."

One reason the third quarter's 18.5% rise in net income was outpaced by the 25.5% increase in the first half is that in 1975 IBM had a stronger second half than it did first half.

Cary said the quatter and nine months showed "satisfactory gains" in earnings. During the most recent quarter, IBM's level of outright sales "continued at the relatively high levels experienced during the earlier quarters of 1976," he added.

Earnings for the quarter, aided by a sharp rise in other income, totaled $586.9 million or $3.90 a share compared with $495.2 million or $3.32 a share in the same period last year.

Other income before taxes, consisting primarily of interest realized, jumped 79.7% to $132.6 million during the quarter. The gain in other income accounted for 32% of the total third-quarter profit increase.

Revenues for the third quarter rose 9.9% to $3.96 billion from $3.6 billion in the same period last year. The 1976 figure was a record for a third quarter.

Income from rentals and sales rose only 3.4% to $2.59 billion while outright sales showed a 24.7% Increase to $1.37 billion.

During the nine months, earnings reached $1.72 billion or $11.47 a share compared with $1.4 billion or $9.41 a share in the year-ago period.

Total revenues rose 13.7% to $11.79 billion compared with $10.37 billion in the nine months last year.

Outright sales jumped 36.2% to $4.11 billion compared with $3.02 billion in the same period last year, while rental and service revenues rose 4.4% to $7.67 billion compared with $7.35 billion a year ago.

Other income during the nine months jumped 42.2% to $356.9 million.

Datatab, Gambit Merging To Market Turnkey Minis

NEW YORK – What do you get when you merge a minicomputer software and consulting firm with a package-oriented service bureau?

Datatab, Inc. and Gambit Management Strategies, Inc. hope to get an aggressive turnkey minicomputer company.

A letter of intent has been signed for the acquisition of Gambit by Datatab, a merger to which Datatab reportedly brings a solid financial position and Gambit a proven marketing group and customer base.

Datatab has been involved primarily in the service bureau business, specializing in packages for the processing of market research data, accounts receivable, law office services and direct mail marketing.

It also offers Solution 77, a package which covers five basic applications: order entry/inventory control/billing; accounts receivable; accounts payable; general ledger; and payroll.

All Ranges

In addition to being in the service bureau business, Datatab has been selling turnkey systems at the low end of the spectrum, in the $40,000 to $90,000 range, according to Stanley Schiffman, president.

Gambit, in addition to selling software and services, has been marketing to the higher end, the $100,000 to $150,000 minicomputer range, he said.

"Together, we anticipate having all the possible ranges covered," Schiffman said.

"We will be in a position to offer our customers what they need with a two-pronged approach – service bureau or minicomputer. It's going to be a much more successful effort for us," he added.

Leonard Farano, executive vice-president of Gambit, described the merger as "typical of what's happening with many service bureau firms.

Beginning to Push

"Because the minicomputers are beginning to push service bureaus around, they in turn are starting to look at minis on two bases – first, to protect their customer base and, second, to see what potential there is for developing a separate mini division."

On that basis, Datatab, like Gambit, became an OEM customer of Digital Equipment Corp. Gambit is also an OEM customer of Data General and Hewlett-Packard.

The new venture will continue to sell software packages and to do customization work, Farano said, "but the trend will be to develop software modules which will be easier to customize than starting from scratch.

"Our thrust will be to develop proprietary packages along an industry segmentation line so we will be able to exploit our experience in the retail and garment textile area and Datatab's experience in the law and apparel industries," he noted.

DG Plans Agreement to Buy DCC

SOUTHBORO, Mass. – Data General Corp. (DG) has announced plans to acquire Digital Computer Controls, Inc. (DCC).

The acquisition would end the longstanding litigation between the two companies, according to a "preliminary understanding" reached last week.

The firms have recently been involved in two suits concerning DCC's alleged misuse of DG trade secrets. The first suit related to DCC's use of DG maintenance logic drawings for the Nova 1200 in the design of DCC's D116 [CW, Nov. 16]; the second charged DCC's models 216, 316, 516 and Mod 5 were derived entirely from the D116 and thus also abused DG's trade secrets [CW, Feb. 2].

Last November, a Delaware court ruled in favor of DG. Under the preliminary acquisition agreement, the Delaware Supreme Court will be asked to delay ruling on an appeal on that decision.

A DG spokesman said the acquisition plan did not arise from the suits.

Contracts

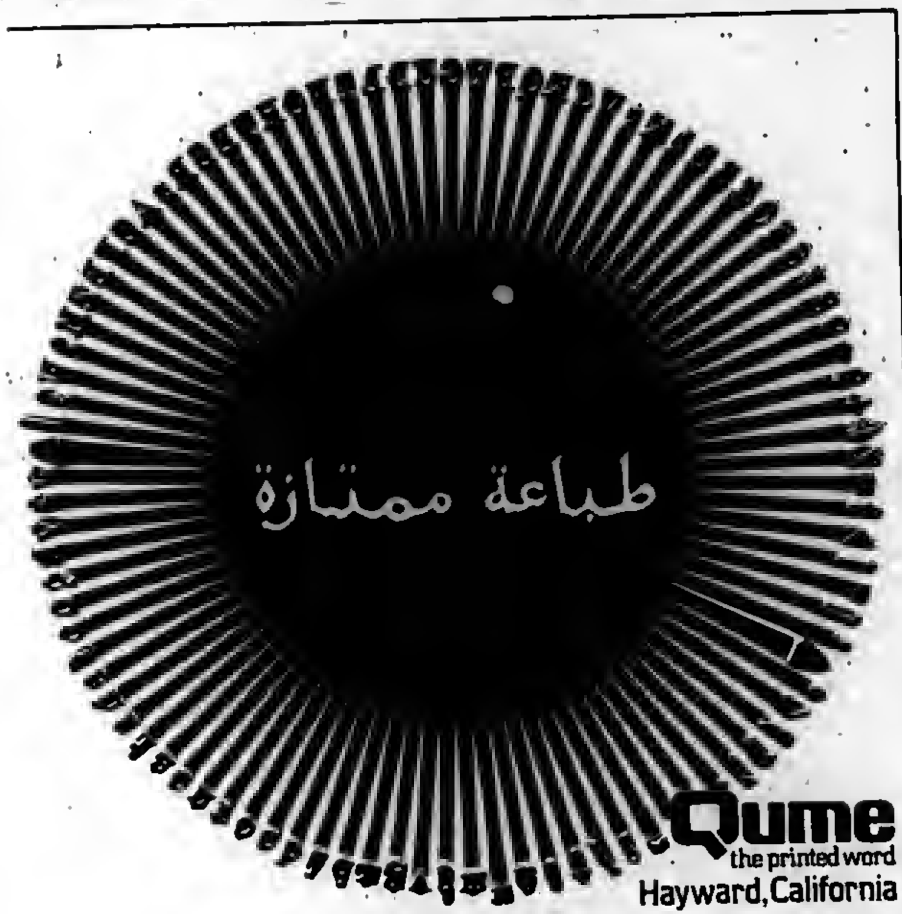
Logican, Inc. has received a contract from the U.S. Department of Transportation to study the feasibility of developing an automated command verification system utilizing computer speech recognition and generation for use on Coast Guard vessels.

National Sharedata Corp. has been awarded a six-year, $3.5 million contract extension from Millikin National Bank of Decatur, Ill., to manage the bank's computer facilities and to market DP services. In addition, National Sharedata has signed a five-year management contract with United Financial Services Corp. of Rockford, Ill., for the operation of its DP facility.

Tai, Inc., a subsidiary of E-Systems, Inc., has received a $260,000 contract from the Administracion Nacional de Telecommunications of the Republic of El Salvador for the preparation of a plan leading to the development of a telecommunications system.

Bunker Ramo has signed a contract with Municipal Credit Union of New York City for the installation of its Model 2001 on-line teller system in each of the 100,000-plus member Municipal Credit Union's teller stations.

System Development Corp. has received contracts from the Automobile Club of Southern California and Garrett Corp. for the installation of on-line, real-time claims administration systems to process health insurance claims.



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See's Revenues Doubling

Small CRT Maker Expects Big Growth

By John P. Hebert
Of the CW Staff

LOS ANGELES – A small manufacturer of compact terminals located here is thinking big – at least in terms of company growth.

Informer, Inc. had gross revenues last year of about $1 million, but projections for this year have been circling around the $2 million mark, according to Byron Cole, the firm's president.

Susie Mora, product inspector, checks out the electronics and cosmetics of a Model 301.

In fact, Informer has been doubling its revenues for the last few years; Cole anticipates – and is planning for – gross revenues to hit the $30 million mark sometime around 1980 solely from the compact CRT terminal and printer market.

"The company is small by a lot of standards, but for us it is a great, young new company," Will Little added. Little is Informer's vice-president of marketing.

"We specialize because there is a real need for compact units. IBM is going to smaller units with smaller CRT screens like the one in the IBM 5100 system because they help concentrate the field of view where a large amount of information needn't be displayed," he said.

The units, he noted, take less room, and there are many applications where a compact terminal and a 6-in. CRT are more useful.

These application sites include the pharmaceutical, banking, library and hotel reservations areas or, as Little put it, "it runs the gamut" of possible installation sites.

The firm's hottest products are an interactive Teletype-replacement terminal known as the Model 301 and the Model 302 poll block terminal with a daisy-chaining capability, Little said.

Informer also has an intelligent device in the Model 303, a user-programmable terminal based on a Signetics Model 2650 microprocessor.

The Model 303 has a signature verification unit as an option for users such as banks – Informer's latest target in the small terminal business, Little said, adding all of the firm's terminals are capable of operation from 110- to 9,600 bit/sec and have RS-232 serial interfaces.

"We're not trying to make terminals for programmers," Cole stressed, explaining the existence and need for compact terminals with small screens.

"We're making terminals for the user to use; they fit in places where other terminals just don't fit. Also, placing large amounts of data on a display defeats the function and purpose of keeping as small an amount of data as possible in the CPU.

"The little terminal lets the computer select information for the user. That's the purpose of the computer," Cole said.

CW Photos by J. Hebert

Andre Johnson runs a program test on a terminal in Informer's production area.

Informer is turning to intelligent terminals as a logical design direction because the cost of intelligence has been decreasing and will be cheaper in the future, he added.

Can Mainframers Hold Profitability After Moving to Combat IBM Pricing?

(Continued from Page 44)

has been reduced to $57,116 or 13%.

The difference between a 90/70 and a 145 or 148 was $351,918, or 30%, and is now $87,188 or 13%.

NCR Corp. and Honeywell Information Systems, Inc. (HIS) introduced the Criterion 8570 and 66/05 respectively after the dual IBM announcement and priced them between the two IBM machines.

HIS extended the main memory size on its 66/10 to 1M byte. The machine costs $79,715, or 12% less than the 148.

While a 1M-byte Burroughs B2800 had a margin of 22% off the 135, it is 6% more than the 138 despite a price cut of $7,000.

The B3800, which had a 3% price advantage compared with the 135, now costs 15% more than a 138.

The new B6807 was announced at a price $40,000 over the 138 but $106,200 less than the 148.

What About Margins?

No longer do sizable price advantages abound. What does this do to the other mainframers' margins?

One fact to keep in mind is that many of the price reductions effected were made possible by a switch to MOS memory. Univac stated its new pricing on its 90/60 has not affected its margins on the product. But can the other manufacturers say the same?

And what if, as some suspect, there will be additional IBM introductions, possibly to fill the price gap that has been created between the 148 and the 158, such as a multiprocessor version of the 148, a further down-pricing of the 158-3 or possibly still another new system introduction?

"Any such moves will further intensify competition at the high end of the marketplace and probably require compensating moves by the other mainframe suppliers in this typically very profitable sector of their business," the consulting firm's report suggested.

And the lower purchase/rental ratio on the 138 and 148 could be interpreted as an indication IBM expects these to have a shorter product life.

The potential introduction by IBM of new products, accelerating the product cycle, "could place further strains on the ability of the other manufacturers to keep pace as well as reducing the time period over which investments in new systems can be recouped," the report observed.

Despite mainframers' responses, the report said, the IBM actions "should slow drastically if not reverse the incursions they have been making into IBM's market share."

In the past, IBM's new systems carried higher price tags, reflecting "the largely replacement character of the market, with IBM's revenue growth dependent on migrating the user up to higher priced systems," the report said.

Also, IBM's price umbrellas for its 135 and 145 were "particularly high."

Analysts cited incursions into IBM's base and indications showing most of IBM's 135 and 145 business was upgrading users already in the IBM fold.

About 47% of the Univac 1106s and 25% of the Univac 9400s installed by respondents in a consultant's survey had replaced IBM systems.

About 15% of B4700s and 8% of B3700s in the survey had replaced IBM systems. And 17% of Honeywell 6000s in the survey replaced IBM units.

BASF Planning Hikes

BEDFORD, Mass. – BASF Systems, Inc. plans to raise prices on its computer tapes by about 10% toward the end of this year.

Although the company has been absorbing past increases in materials costs, in some cases up 20% in the past two years, price erosion in the tape market is forcing BASF to pass part of the increases on to customers, according to John J. Healion, director of marketing for BASF's computer and business products.

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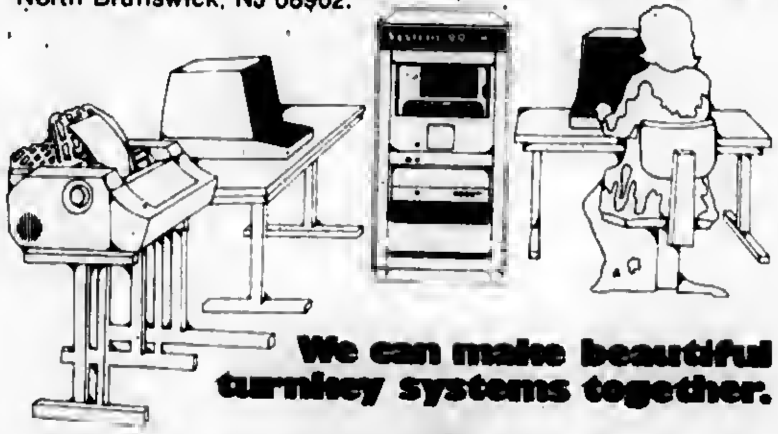

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Russians Testing NCR POS Units

RIGA, USSR – Babushkas, caviar and borscht are a few of the items soon to be processed through the checkout stand by a point-of-sale (POS) system here.

NCR is installing two POS test sites in the USSR, one in Leningrad and one here. Both installations are similar, according to Udo W. Birk, director of international retail systems.

In Riga, NCR has installed 11 NCR 250 electronic cash registers equipped with tape cassettes and color bar code wand readers.

The system also includes an NCR 8200, two NCR 7200 data entry units and an NCR 747 tag printer which will produce color bar coded tags.

"The store in Riga handles about 40% soft goods and 60% food or grocery items," Birk said. "The plan is to tag all soft goods with a color bar code and then automatically read them at the point of service."

The Leningrad installation, scheduled for later this year, will be the same as Riga's except the terminals will be used at the point of service.

Field engineering support for the two installations will be available from an NCR-trained USSR field service organization, Birk said. NCR will offer assistance if major problems develop, he added.

"We will not have NCR personnel at the test sites, other than at the initial installation time. But support people are available on short notice as needed," he said.

"Our representatives are in Moscow four to five times each year for periods of two to three weeks on a regular basis," he noted.

Other Orders & Installations

Morinaga & Co. Ltd. of Tokyo, a confectionary manufacturer, has ordered a Univac 1100/11 system from Nippon Univac Kaisha, Ltd. for integrated sales and inventory control applications.

Stovner Supermarket, near Oslo, has installed Norway's first NCR 255 checkout system including eight Model 255 terminals linked to a Model 726 minicomputer.

ELF-Aquitaine, a French national oil producing and distributing group, has ordered a Model 32 minicomputer and related peripherals from Systems Engineering Laboratories, Inc. The equipment will process data from seismic explorations.

L.M. Ericsson, Stockholm, has ordered Model 1520 tape drives from Kennedy Co.

Lloyd's of London has ordered a PDP-11/70 from Digital Equipment Corp. for use in a four-year project to optimize the company's services.

Elder Smith Goldsbrough Mort Ltd. has ordered three NCR Criterions to be used as the basis of an Australian network for order entry and billing applications.

France's Centre Informatique de Gestion Appliquee has installed a Cyber 172 system from Control Data Corp. for use in loans processing.

The Chilbolton Observatory in Hampshire, England, has installed a pair of GEC 4080 computers from GEC Computers Ltd.

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If you think you can qualify for any of these positions, send your resume todey to:

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Minimum 5 years systems design experience in commercial applications. Knowledge of DEC systems, hardware, software and operating systems. Ability to communicate effectively and successful management experience a must.

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Minimum three years experience in systems analysis preferably with mini-computer applications and programming background. Aggressive, resourceful self-starters to be involved in feasibility studies, systems design and program specifications.

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Minimum three years experience in commercial application programming. Experience in Basic, Dibol, Fortran or Cobol desirable, Time Sharing a plus.

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Manitoba Data Services is a major Canadian computer utility offering a wide range of information systems products and services. Since we are a division of the Manitoba Telephone System, our emphasis is directed towards distributed data base/data communications systems. We have been in the data processing business since 1959, In our previous role as the Manitoba Government Computer Centre. We are committed to state-of-the-art application technology and are presently servicing a large and rapidly expanding data communications network, supported by IBM 370 168 and 158 hosts.

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- development of a corporate marketing plan including establishment of sales and revenue targets.
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- participation in overall corporate planning.

Manitoba Data Services offers an attractive compensation plan for the qualified candidate as well as a comprehensive benefit plan and relocation assistance.

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Personnel Department, Room 101
489 Empress Street
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Programmer

POS Applications Analyst

Progressive Point-Of-Sales systems manufacturer is seeking an Applications Analyst with a programming background. Position will be responsible for providing customer assistance in-implementing and utilizing EOS systems at the customer data center. Activities will be centered in the New Jersey/New York area and will require occasional travel to surrounding states.

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Send your confidential resume, including salary history to: Dave Levesque, 140 Sylvan Avenue, Englewood Cliffs, New Jersey 07632. We are an affirmative action equal opportunity employer male and female.

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PROGRAMMING

DATA BASE Administration Analyst

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S.F. Bay Area Community College seeking a qualified individual to assist with the design, development, and implementation of new timesharing and batch systems on a recently installed DEC System 10; to provide technical guidance to faculty, staff, students. Candidates must have a broad range of skills and experience in design and implementation of systems, preferably in a college environment. Minimum 3 years experience in systems and programming. B.S. degree desirable with a major in data processing or computer science. Apply to Solano Community College, P.O. Box 246, Suisun City, Ca. 94585. Deadline Date: November 19, 1976.

PROGRAMMER/ANALYST
Eastern Montana College — Billings, Montana

The Computer Center of a liberal arts state college, responsible for computational services for academic and administrative needs, is expanding its facilities to a DECsystem-10 and is seeking a qualified Programmer/Analyst to design and program a variety of administrative systems.

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3-4 years of programming and design experience using COBOL, with systems analysis knowledge of the DECsystem-10 or other major time-sharing systems required. Strong accounting background and experience in a college environment with on-line systems preferred.

Beginning salary $14,332.

Send a letter of application, complete resume, current references, and salary history by November 8, 1976, to:

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Must have deomonstrated ability to operate the latest ADP Systems.

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PROGRAMMERS

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- PQS Applications Programming
- On-Line Data Communications
- POS Terminal Programming

Candidates for either area should have experience in two or more of the following areas: minicomputer, assembly language, real time, systems/utility programming, customer or field interface, POS application software.

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Oakland County is in the midst of rapidly expanding its teleprocessing system which serves County government and many units of local government, including a 23 agency law enforcement information network, and will begin a conversion from DOS/VS to OS/VS1 this fall.

Salary range: $17,715-$19,671. Beginning salary is dependent upon applicability of prior experience and qualifications. The salary is supplemented by an outstanding fringe benefit package.

Applications will be accepted until further notice.

For additional information or to obtain the necessary application materials, please contact:

The Personnel Department
OAKLAND COUNTY
1200 N. Telegraph Rd.
Pontiac, MI 48053
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One of suburban Detroit's most dynamic organizations has a brand new upper-echelon position for a uniquely qualified individual. First, you'll need heavy experience in accounting, with emphasis on corporate account analysis, internal audit programs and credit/collection management. Second, the ideal candidate will have an equal amount of experience in systems design and analysis, especially in problem identification, control procedures and management interface. CPA and MBA degrees desirable, but not mandatory.

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Manuel Garcia
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1351 N.W. 12th St., Rm. 808
Miami, Florida 33125
or call: 305-547-7033

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Applicants should have 4 to 6 years DP background with significant experience in administering, planning and coordinating a department. A Bachelor's degree in business, computer science, or related field is required.

PROGRAMMERS SYSTEMS AND APPLICATIONS

Background should include 2 to 3 years of solid computer experience with on-line PDP-11/40 or PDP-12 in one or more of the following areas: Clinical Lab, on-line order entry, Multitest, Pharmacy, Medical Records. Knowledge of MUMPS is a definite plus.

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Candidates should have 2 to 3 years IBM System 3 experience with Financial Systems including A/R, A/P, Inventory, and Gen. Ledger. Background related to hospital information processing a definite plus.

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South & Southwest: Atlanta (404/634-5127), Dallas (214/638-4080), Fort Worth (817/338-9300), Houston (713/626-8705), New Orleans (504/523-2576).

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R.J. Reynolds Industries, Inc., Winston-Salem, North Carolina, has several new openings within the Computer Planning Department for experienced BAL Programmers.

Applicants should possess the following:

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Send resume and salary requirements, in confidence, to:

Mr. Denis G. Simon
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RJR

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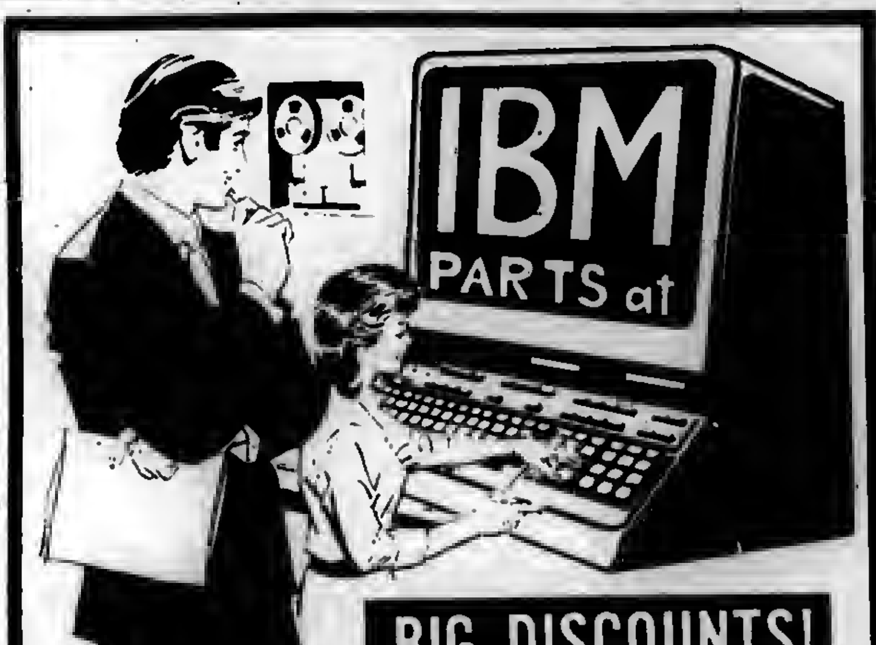

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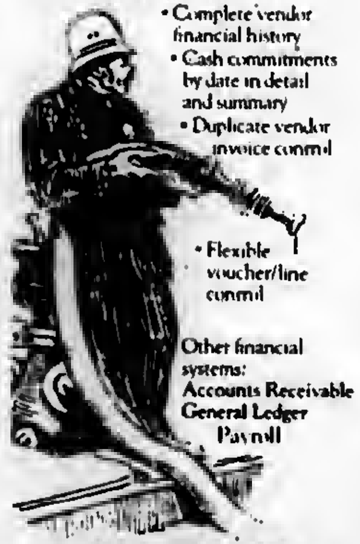

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CDC Earnings Jump 63% in Third Quarter

MINNEAPOLIS – Control Data Corp. managed to get both its computer operations and Commercial Credit Co. subsidiary on the same upward track during the third quarter and nine months.

As a result, earnings jumped 63% in the third quarter compared with the restated year-ago figures.

"For the first time in several years, we are seeing a good improvement occurring simultaneously in both our financial and computer operations," William C. Norris, CDC chairman, said.

During the third quarter, computer business income rose 28% to $5.5 million compared with $4.3 million in the same period last year. It more than doubled in the nine months.

Revenues in the computer business rose to $329.1 million compared with $310.2 million in the year-ago quarter. Broken down, sales contributed $151.9 million compared with $148.4 million while rental and services revenue accounted for $171.8 million compared with $155.8 million in the same period last year.

Quarter Results

For the quarter, CDC's corporate earnings totaled nearly $15 million or 87 cents a share compared with a restated $9.2 million or 53 cents a share. This was $811,000 less than the earnings posted originally for the 1975 period.

The company's computer business is increasingly feeling the positive effects of the economic recovery, Norris said.

Orders for systems are reflecting less special technical content, he noted, and margins on rentals, services and sales of systems all improved during the third quarter.

In addition, better management of computer business assets resulted in a nine-month savings of $8 million in interest expense, he said.

CDC increased its R&D expenditures during this period to $41.8 million compared with $34.7 million, he said.

Demand for OEM peripherals continued to improve.

During the nine months, CDC's corporate earnings totaled $36.7 million or $2.12 a share compared with a restated $29.4 million or $1.73 a share, down $3.4 million from the original figure.

The computer operations contributed $9.1 million compared with $4.2 million in the same period last year.

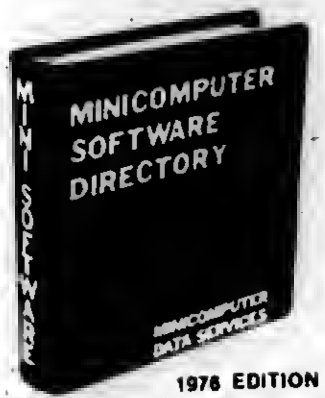
Computer revenues rose to $970.8 million compared with $891.6 million in the 1975 nine months.

Sales reached $466.8 million compared with $412.6 million while rental and services revenues rose to $486.4 million compared with $462.3 million.

Commercial Credit's contributions to earnings rose 92% in the third quarter to $9.5 million. Its revenues were slightly below the $164 million reported in the third quarter last year, the firm said.

During the nine months, Commercial Credit's income rose to $27.6 million compared with $25.2 million in the same period last year.

Combined computer and Commercial Credit revenues for the nine months rose to $1.45 billion compared with $1.39 billion for the first nine months of 1975.



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Third Quarter Also Record

Burroughs Posts Nine-Month Records

DETROIT – Burroughs Corp. turned in record earnings and revenue for both its third quarter and nine months with earnings rising 13% and 9% respectively over restated 1975 results.

Burroughs' third-quarter earnings totaled $37.2 million or 92 cents a share compared with a restated $32.8 million or 83 cents a share in the year-ago period.

In restating its 1975 results to include unrealized exchange gains on foreign currency long-term debt, Burroughs increased its 1975 third-quarter earnings from $27.5 million.

Revenues for the quarter rose to $443.2 million compared with $367.7 million in the same period last year. Rental and service revenue increased 23% in the third quarter while revenues from outright sales rose 18% compared with the year-ago figures.

During the nine months, Burroughs' earnings reached $103.9 million or $2.58 a share compared with a restated $95.3 million or $2.41 a share in the same period last year. The 1975 figure was $91.6 million before it was restated.

Revenues during the nine months rose 14% to $1.3 million compared with $1.1 million in the year-ago period.

Rental and service revenues increased 24% while revenue from outright sales rose 7%.

The strong order trend of the past several quarters continued in the third quarter, according to Ray W. Macdonald, Burroughs chairman.

Worldwide orders for the nine-month period rose 22% over the same period last year, he said, and orders were good in both the U.S. and overseas markets.

Burroughs' backlog has risen 11% since the beginning of the year.

NCR Earnings Soar 58% in Quarter

DAYTON, Ohio – NCR Corp.'s third-quarter earnings jumped 58% on a 9% increase in revenues compared with the year-ago figures.

The improved third-quarter results were credited by Chairman William S. Anderson principally to improved margins resulting from the company's new products programs and to continued expense control measures.

Sale of Subsidiary

NCR sold a subsidiary, Electronic Communications, Inc., which resulted in a $2.1 million gain in the third quarter.

"Increased shipments of computerized systems for retail stores, banks and other financial institutions also played a role," Anderson said.

In the third quarter, NCR's earnings totaled $25 million or 93 cents a share compared with $15.9 million or 65 cents a share in the same period last year.

Revenues rose to $569.5 million compared with $521.6 million in the year-ago quarter.

During the nine months, NCR's earnings reached $56.8 million or $2.19 a share compared with $55.2 million or $2.22 a share in the 1975 nine months.

Revenues for the same period totaled $1.6 million compared with $1.5 million in the year-ago period.

Bookings Increase

"Incoming business was generally good during the third quarter and included a substantial increase in bookings outside the U.S. compared with last year's third quarter," Anderson said.

He expects fourth-quarter earnings to be "well ahead" of those in the same period last year, which should bring an increase in earnings for the 12 months, he said.

Correction

Rapidata's revised contract with New York Telephone [CW, Oct. 11] could impact solely the firm's revenues generated from that contract, according to a company spokeswoman. The revisions are not expected to have any impact on the company's overall revenues for the year, which are expected to grow, she said.

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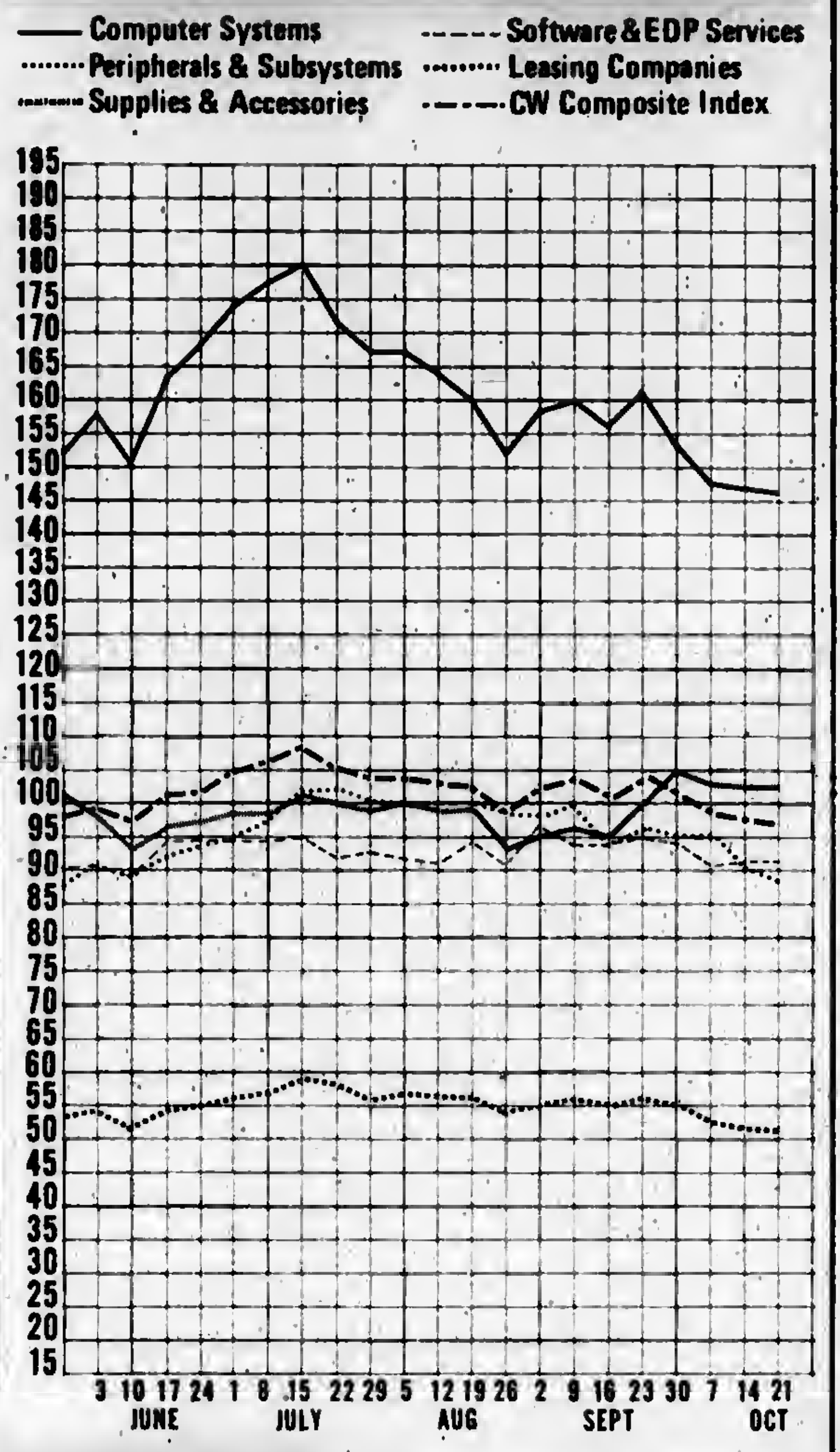
NOTICE TO BIDDERS

Commonwealth of Massachusetts, Executive Office of Administration and Finance, Bureau of Data Processing and Telecommunications, Administration and Finance Computer Services Center Procurement — Q000016. Proposals will be received by the Commonwealth of Massachusetts Purchasing Agent's Division, 10th floor, John W. McCormack State Office Building, 1 Ashburton Place, Boston, Mass. 02108 up until 2:00 p.m. 11/18/76 for the Administration and Finance Computer Services Center Procurement, which includes the development of Integrated Financial Information and Processing systems, along with associated hardware and software. The request for proposal, identified as the Administration and Finance Computer Services Center Procurement — Q000016 may be obtained at the above address. Bids received after the date and hour named will not be considered. The State Purchasing Agent reserves the right to reject any or all bids and to accept the bid that is in the best interests of the Commonwealth. A bidder's prequalification conference will be held on Oct 26, 1976 at 10:00 a.m., Conference Rooms 2 and 3, 21st floor, John W. McCormack State Office Building, 1 Ashburton Place, Boston, Mass. All interested bidders are invited to attend. Purchasing Agent's Division, Alfred C. Holland, State Purchasing Agent.

COMPUTERWORLD Computer Stock Trading Indexes



Earnings Reports

DIEBOLD
Three Months Ended June 30

	1976	1975
Shr Ernd	$.39	$.15
Ravenua	45,927,887	46,642,961
Earnings	2,244,289	830,191
6 Mo Shr	.63	.51
Revenua	89,062,175	100,831,132
Earnings	3,570,410	2,918,924

GRAPHIC CONTROLS
Three Months Endad June 30

	1976	1975
Shr Ernd	$.82	d$.48
Ravenua	14,393,000	10,052,000
Earnings	a1,037,000	b518,000
6 Mo Shr	1.39	d.98
Revenua	29,243,000	20,588,000
Earnings	e1,753,000	b1,054,000

a-Includes gain from sala of $341,000 invastment in quarter and $362,000 in six months. b-Includas gain from sala of $58,000 investment. d-Adjusted for June 1976 five-for-four stock split.

MEDTRONIC
Thraa Months Ended July 31

	1976	1975
Shr Ernd	$.53	$.46
Ravenue	35,867,000	31,878,000
Disc Op	......	(54,000)
Earnings	3,945,000	3,430,000

SCAN-DATA
Thrae Months Endad June 30

	1976	a1975
Shr Ernd	$.09	$.06
Revenue	4,378,908	2,553,916
Tax Cred	75,000	41,000
Earnings	167,906	103,764
6 Mo Shr	.10	.10
Revenue	7,666,316	5,030,362
Tax Cred	84,000	81,000
Earnings	184,434	179,396

a-Restated.

SYSTEMS ENGINEERING
Yaar Ended June 25

	1976	1975
Shr Ernd	$.02	.....
Revenua	20,003,100	$17,457,664
Tex Cred	197,860	135,871
Eernings	59,389	(321,889)
3 Mo Shr	.15	.....
Revanua	6,317,095	4,224,238
Tax Cred	197,860	135,871
Earnings	403,285	(32,732)

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, OCTOBER 20, 1976

All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH.		PRICE 1976 RANGE (1)	CLOSE OCT 20 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	84-108	89 5/8	+1 5/8	+1.8
C	COMPUTER AUTOMATION	10- 19	15	+ 1/4	+1.6
N	CONTROL DATA CORP	18- 27	23 3/8	+ 1/8	+0.5
N	DATA GENERAL CORP	40- 60	40 7/8	-3 1/4	-7.3
O	DATAPOINT CORP	24- 46	27 1/4	-1 1/2	-5.2
O	DIGITAL COMP CONTROL	2- 7	6 1/8	+ 1/8	+2.0
N	DIGITAL EQUIPMENT	138-191	145 3/4	-5 3/4	-3.7
N	ELECTRONIC ASSOC.	2- 5	2 5/8	0	0.0
A	ELECTRONIC ENGINEER.	7- 16	9 1/4	+ 5/8	+7.2
N	FOXBORO	28- 50	44 1/2	- 1/2	-1.1
O	GENERAL AUTOMATION	4- 11	4 1/2	+ 1/8	+2.8
O	GRI COMPUTER CORP	1- 1	5/8	0	0.0
N	HEWLETT-PACKARD CO	82-117	81 7/8	-4 7/8	-5.6
N	HONEYWELL INC	34- 56	43 3/4	+1 3/8	+3.2
N	IBM	227-288	263 1/2	-9	-3.3
O	MANAGEMENT ASSIST	1- 3	1 3/4	+	+3.5
O	MEMOREX	18- 33	20 5/8	-1 3/8	-6.2
O	MICRODATA CORP	10- 28	19	-2 5/8	-12.1
O	MODULAR COMPUTER SYS	4- 14	4	+ 1/4	+6.6
N	NCR	24- 37	34 5/8	- 1/8	-0.3
C	PRIME COMPUTER INC	4- 14	12 1/4	- 1/2	-3.9
N	PERKIN-ELMER	19- 27	20 5/8	-1 1/2	-6.7
N	RAYTHEON CO	45- 67	64 3/8	+1	+1.5
N	SPERRY RAND	40- 52	45	- 1/4	-0.5
O	SYCOR INC	12- 31	11 3/4	- 3/4	-6.0
A	SYSTEMS ENG. LABS	6- 10	6 3/4	+ 1/8	+1.8
N	VARIAN ASSOCIATES	12- 17	12 1/2	- 1/4	-1.9
A	WANG LABS.	11- 20	14 1/4	+ 3/8	+2.7

LEASING COMPANIES

EXCH.		PRICE 1976 RANGE (1)	CLOSE OCT 20 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMDISCO INC	3- 10	8 3/4	- 3/4	-7.8
A	COMMERCE GROUP CORP	2- 3	1 7/8	- 1/8	-6.2
A	COMPUTER INVSTRS GRP	1- 3	1 5/8	- 1/4	-13.3
M	DATRONIC RENTAL	1- 8	7/8	0	0.0
A	DCL INC	1- 1	5/8	+	+10.0
N	DPF INC	5- 8	6 5/8	- 1/4	-3.6
N	ITEL	6- 15	12 5/8	+ 7/8	+7.4
N	LEASCO CORP	6- 19	17 1/2	+1 1/2	+9.3
O	LEASPAC CORP	0- 1	1/8	0	0.0
O	NRG INC	0- 1	1/8	- 1/8	-39.9
A	PIONEER TEX CORP	6- 9	7 1/4	0	0.0
N	U.S. LEASING	7- 12	8 5/8	- 1/8	-1.4

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
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SOFTWARE & EDP SERVICES

EXCH.		PRICE 1976 RANGE (1)	CLOSE OCT 20 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 3	1 1/2	0	0.0
C	ANACOMP INC	6- 11	7 1/2	+ 3/8	+5.2
A	APPLIED DATA RES.	2- 4	3 1/4	+ 1/8	+4.0
N	AUTOMATIC DATA PROC	17- 35	27 3/8	+ 3/8	+1.3
C	COLEMAN AMERICAN COS	2- 6	2 1/4	+ 1/8	+5.8
C	COMPUTER DIMENSIONS	3- 7	5 3/4	+ 1/4	+4.5
O	COMP ELECTION SYSTMS	5- 9	5 1/4	- 1/2	-8.6
C	COMPUTER HORIZONS	1- 2	1 1/4	- 1/4	-16.6
C	COMPUTER NETWORK	2- 6	5	- 3/4	-13.0
N	COMPUTER SCIENCES	4- 8	5 7/8	+ 1/4	+4.4
C	COMPUTER TASK GROUP	1- 2	1 1/4	- 3/8	-23.0
O	COMPUTER USAGE	3- 6	3 1/8	+ 1/8	+4.1
C	COMSHARE	2- 9	4 1/2	- 1/4	-5.2
O	DATA DIMENSIONS INC	2- 4	2 3/4	0	0.0
O	DATATAB	1- 1	1 3/8	0	0.0
N	ELECTRONIC DATA SYS.	12- 18	15 1/2	- 1/8	-0.7
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	INSYTE CORP	1- 3	1 5/8	+ 1/8	+8.3
C	IPS COMPUTER MARKET.	1- 2	1 1/8	- 1/8	-10.0
O	KEANE ASSOCIATES	2- 4	2 1/4	0	0.0
O	KEYDATA CORP	2- 5	1 5/8	0	0.0
C	LOGICON	3- 4	3 3/8	0	0.0
A	MANAGEMENT DATA	1- 3	2 1/8	- 1/8	-5.5
A	NATIONAL CSS INC	13- 25	19 5/8	0	0.0
A	ON LINE SYSTEMS INC	17- 22	17 3/8	- 3/4	-4.1
N	PLANNING RESEARCH	3- 5	3 3/8	0	0.0
O	PROGRAMMING & SYS	1- 1	3/8	0	0.0
O	RAPIDATA INC	2- 5	1 5/8	0	0.0
O	REYNOLDS & REYNOLD	13- 21	15	- 3/4	-4.7
O	SCIENTIFIC COMPUTERS	1- 1	7/8	0	0.0
O	TYMSHARE INC	15- 28	18	+2 3/4	+18.0
A	URS SYSTEMS	3- 5	3 3/4	+ 1/8	+3.4
N	WYLY CORP	2- 7	1 3/4	+ 1/4	+16.6

PERIPHERALS & SUBSYSTEMS

EXCH.		PRICE 1976 RANGE (1)	CLOSE OCT 20 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	8- 13	9 7/8	0	0.0
O	ADVANCED MEMORY SYS	4- 10	6 5/8	+ 3/8	+6.0
N	AMPEX CORP	5- 10	6 1/4	+ 1/4	+4.1
O	ANDERSON JACOBSON	2- 4	2 7/8	0	0.0
C	APPLIED DIG DATA SYS	13- 25	19	+ 3/4	+4.1
O	BEEHIVE MEDICAL ELEC	3- 9	8 1/4	- 1/8	-1.4
A	BOLT,BERANEK & NEW	7- 11	7 7/8	+ 1/4	+3.2
N	BUNKER-RAMO	5- 10	6 1/2	0	0.0
A	CALCOMP	4- 7	4	+ 1/8	+3.2
O	CAMBRIDGE MEMORIES	0- 6	1/2	+ 1/8	+33.3
N	CENTRONICS DATA COMP	20- 36	29 1/4	-1 1/2	-4.8
C	CODEX CORP	22- 42	31	+2 1/2	+8.7
C	COGNITRONICS	1- 1	3/4	0	0.0
O	COMPUTER COMMUN.	1- 6	5	- 3/8	-6.9
O	COMPUTER CONSOLES	4- 7	4 1/2	0	0.0
A	COMPUTER EQUIPMENT	1- 3	1 7/8	+ 1/8	+7.1
O	COMPUTER TRANSCEIVER	1- 3	3/4	- 1/4	-25.0
C	COMTEN	4- 9	6 3/4	- 1/2	-6.8
N	CONRAC CORP	20- 25	21	+ 1/8	+0.5
O	DATA ACCESS SYSTEMS	1- 5	4 1/2	- 1/4	-5.2
O	DATA 100	7- 13	8 1/4	0	0.0
A	DATA PRODUCTS CORP	5- 15	10 7/8	0	0.0
O	DATA TECHNOLOGY	1- 2	1 1/4	0	0.0
O	DATUM INC	1- 2	7/8	- 1/8	-12.5
O	DECISION DATA COMPUT	1- 4	1 5/8	0	0.0
O	DELTA DATA SYSTEMS	1- 1	5/8	0	0.0
N	ELECTRONIC M & M	1- 4	3 1/8	- 1/8	-3.8
O	FABRI-TEK	1- 1	3/4	0	0.0
C	GENERAL COMPUTER SYS	1- 2	1/2	- 1/8	-20.0
N	HAZELTINE CORP	4- 12	8 1/8	- 1/8	-1.5
N	HARRIS CORP	34- 55	50 1/2	+1 1/2	+3.0
A	INCOTERM CORP	9- 20	12 5/8	0	0.0
O	INFOREX INC	3- 7	4 1/8	0	0.0
C	INFORMATION INTL INC	10- 18	12	+ 1/2	+4.3
O	INTEL CORP	54-109	59	+1 1/2	+2.6
A	LUNDY ELECTRONICS	3- 7	3 5/8	+ 1/4	+7.4
O	MSI DATA CORP	3- 7	5 7/8	0	0.0
A	MILGO ELECTRONICS	15- 21	16 3/4	+ 7/8	+5.5
N	MOHAWK DATA SCI	3- 10	6 1/4	+ 5/8	+11.1
C	PENRIL CORP	1- 3	1 7/8	- 1/8	-6.2
A	PERTEC CORP	3- 8	6	- 1/8	-2.0
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	3- 10	2 1/2	- 1/2	-16.6
C	QUANTOR CORP	4- 6	3 7/8	- 1/8	-3.1
O	RECOGNITION EQUIP	6- 11	7 7/8	- 1/8	-1.5
N	SANDERS ASSOCIATES	6- 11	8	- 3/8	-4.4
O	SCAN DATA	2- 4	1 1/2	-	-4.0
O	STORAGE TECHNOLOGY	9- 13	10	0	0.0
O	T BAR INC	5- 10	5 3/4	0	0.0
O	TALLY CORP.	4- 6	3 7/8	- 1/8	-3.1
O	TEC INC	3- 7	6 1/4	- 1/4	-3.8
N	TEKTRONIX INC	45- 69	62 3/8	0	0.0
N	TELEX	2- 5	2 5/8	0	0.0
O	WANGCO INC	11- 22	21 1/8	0	0.0
O	WILTEK INC	2- 2	1 5/8	- 1/4	-13.3

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O	BALTIMORE BUS FORMS	3- 5	3 5/8	0	0.0
A	BARRY WRIGHT	6- 10	8 3/4	- 1/4	-2.7
O	CYBERMATICS INC	1- 1	1/2	0	0.0
A	DATA DOCUMENTS	25- 45	45 1/4	0	0.0
O	DUPLEX PRODUCTS INC	13- 24	13 3/8	- 3/8	-2.7
N	ENNIS BUS. FORMS	6- 8	5 5/8	- 1/4	-4.2
O	GRAHAM MAGNETICS	8- 13	10	- 1/2	-4.7
O	GRAPHIC CONTROLS	13- 19	15 3/4	+ 1/4	+1.6
N	3M COMPANY	53- 66	61 1/4	0	0.0
O	MOORE CORP LTD	33- 51	32 3/4	0	0.0
N	NASHUA CORP	11- 18	17 1/4	+ 7/8	+5.3
O	STANDARD REGISTER	15- 19	17 1/2	+ 3/4	+4.4
O	TAB PRODUCTS CO	5- 11	9 1/2	0	0.0
N	UARCO	20- 25	20	- 1/8	-0.6
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N	WALLACE BUS FORMS	19- 25	22	- 1/8	-0.5

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NEWSPAPER

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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CW Photo by A. Dooley

IBM's Mike McNulty makes his pitch on the exhibit floor of Info/Expo '76 in Las Vegas last week. Coverage of the conference, sponsored by the Data Processing Management Association, continues on Pages 2-7.

Software Developers Charged With Misapplication of Time

By Ronald A. Frank
Of the CW Staff

LAS VEGAS – Today's software developers spend too much time testing programs and not enough time designing them, Dr. Leon Presser, an independent consultant from Santa Barbara, Calif., told attendees at Info/Expo 76 here last week.

Because programmers spend most of their time in the testing phase, they generally believe it is best to hurry into this aspect of software development, Presser said.

Instead, they should expend more effort on the analysis and design of programs, he stated.

A typical software project has four stages: analysis, design, coding and testing. Only 5% of the time is usually spent on analysis while 50% is spent on testing. Design accounts for about 30% of the time while coding takes up 15%, he estimated.

But if something goes wrong with a program, the user winds up looking at the basic design of the software. In this sense, "there are no users today; we are all developers," he said.

In experiments with software development where more attention has been given to design, the results have been encouraging, Presser noted.

One test involved a Fortran program requiring 1,200 lines of code. Eighty-two percent of the time was spent on design

(Continued on Page 4)

Investigator for Insurers Indicted for Procuring Sensitive FBI, IRS Data

By Nancy French
Of the CW Staff

DENVER – Sensitive government data banks were allegedly tapped routinely by investigators for the 56 insurance companies indicted here last summer for invasions of individual privacy, impersonation and conspiracy [CW, June 28].

Factual Service Bureau, Inc., indicted and put out of business in this state but still operating elsewhere under the name Innerfacts, Inc., was charged with obtaining criminal records, tax returns and medical records for insurance companies for use in settling claims, former employees of the firm said.

Although the investigation is proceeding behind the closed doors of a grand jury hearing room, information not bearing on the cases that will be brought against the firms in this state has been released by court order, according to District Attorney Dale Tooley. The names of the insurance companies have not yet been made public.

Factual's employee training manuals told employees not only what information to go after, but also "how to" get it, according to a staff member for Rep. Barry Goldwater Jr. (R-Calif.), assigned to investigate the matter further.

In most cases, only a telephone call was necessary, he indicated.

Employees of the firm obtained criminal history information – even from the Federal Bureau of Investigation's (FBI) computerized criminal history system – in three ways:

- Posing as an officer from a neighboring police department that did not have access to the FBI system.
- Posing as a New York police officer at a Manhattan precinct and leaving a call-back number that was actually the number at Factual Service Bureau's Manhattan office.
- Hiring a private investigator who obtained the information from a friend at the Columbus, Neb. Police Department.

Nationwide Operation

Tooley emphasized the Chicago-based firm's illegal operation was not limited to Colorado, but was going on "all over the country," according to information turned up by his team of investigators.

"There was nothing criminal on the part of the police departments that gave out the information," he added. The individuals who answered the phone requests believed what the callers were telling them.

Furthermore, "when you have 40,000 arrests a year and thousands of small enforcement agencies contacting major police departments for information like this every day, it is impossible to keep records," Tooley said.

"The only records are between the investigator and his customer" – the insurance company, he said.

Tax returns were obtained from the

(Continued on Page 4)

Second Processor, More Memory Added to Upgrade IBM 370/158

By Esther Surden
Of the CW Staff

WHITE PLAINS, N.Y. – IBM announced enhancements to the 370/158 last week to boost its performance and increase its memory.

A second instruction processor has been added to the 158 to provide 1.5 to 1.8 times the internal performance of a 158 with one instruction processor, IBM said.

In addition, the 158's maximum main memory has been expanded to accommodate 6M characters compared with the 4M characters previously available.

The Model 158 Attached Processor System (APS) is similar to a configuration announced for the 370/168 in February [CW, Feb. 23]. The APS was designed to add the instruction execution elements of a second 158 to the user's system "to provide an alternative growth option to a complete multiprocessing system," a company spokesman said.

In the APS system, a second instruction processor, the IBM 3052 attached processing unit, is linked to the host CPU. All main memory and I/O capability is provided by the host processor but shared with the second instruction processor in a tightly coupled attached processing mode, the spokesman said.

The second instruction processor features a high-speed 16K buffer, he added.

Current 158 users with either the 158 or the 158-3 CPU can upgrade to the APS configuration in the field at a minimum additional monthly rental price of $14,935 and a minimum purchase price of $452,500, IBM said.

The upgrade includes enhancements to the CPU that synchronize timing between the host CPU and the attached processor unit. It also includes functions that allow the second instruction processor to access the CPU's main memory and some other hard-wired changes, IBM said.

Besides the additional instruction proc-

(Continued on Page 4)

Unlike Tennessee

N.Y. Taxing Software, Services

By Molly Upton
Of the CW Staff

NEW YORK – In moves that may affect users and vendors alike, New York State is mounting a campaign to tax both software and DP services under a set of wide-reaching regulations effective Sept. 1, 1976.

The laws themselves have not changed; what has changed is the state Department of Taxation and Finance's interpretation of what is taxable under the laws.

One company – Computer Task Group, Inc. (CTG) of Buffalo – has been asked by the Department of Taxation and Finance to pay taxes which the state claims the firm should have collected in the past from its customers (see related story on Page 42).

CTG interpreted the state's action as an attempt to collect taxes on software retroactively. But Paul Greenberg, secretary to the state tax commission, denied any effort on the part of the state to retroactively collect taxes on software – something that previously was entirely exempt from taxation.

No Retroactive Collection

The new regulations were part of a task force effort to codify the state's 11-year-old sales and use taxes, Greenberg said. In studying the laws, legal experts with the task force decided the previous interpretation that software was not taxable was legally incorrect.

"But if we tried to collect retroactively, we'd probably put the computer software business out of business in the State of New York," he said. Furthermore, "it wouldn't be legal and it just wouldn't be fair."

Most contracts between a DP vendor and a user specify the user is responsible

(Continued on Page 3)

Privacy Law Needed, EFT Commission Told

By Toni Wiseman
Of the CW Staff

WASHINGTON, D.C. – Unless Congress enacts a new national law to protect individuals whose personal records will be transferred electronically, individuals will have no way of defending themselves against violations of their personal privacy, according to Alan F. Westin, professor of public law and government at Columbia University.

Testifying before the National Commission on Electronic Fund Transfers (EFT) here last week, Westin said "the age of clean air and water as 'free goods' is over and so ought to be the age of free commercial use of our personal profiles."

Westin was one of many witnesses asked to address how EFT information, which could reflect a consumer's habits, travel and political and religious persuasions, should be protected against negligent or intentional misuse.

(Continued on Page 6)

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As Grosch Tells It

DP Fairy Tale Has Three Dwarfs Left

By Ann Dooley
Of the CW Staff

LAS VEGAS – Once upon a time there lived Snow White and seven dwarfs, but those days are gone now, according to Dr. Herbert R.J. Grosch, president of the Association for Computing Machinery.

Grosch's version of the story had only three dwarfs – Burroughs Corp., Univac Corp. and Digital Equipment Corp. – left, and Snow White – or IBM – had turned into a "Grim Gray Giant."

"Burroughs is the secret dwarf that makes a great product, but the trick is to get it," Grosch told a luncheon gathering at Info/Expo '76 here last week.

"DEC is the IBM of the minis and is now a large dwarf. 'National Point-of-Sale' – NCR – and Control Data Corp. are no longer attached to Snow White. And Honeywell is having a garage sale," he continued.

CW at Info/Expo '76

The industry is changing and growing rapidly from both ends of the spectrum. The minicomputer and microcomputer business is expanding economically and technically at a much faster rate than the middle ground, according to Grosch.

"These markets will reach their limits eventually, but it's way down the road," he said.

In forecasting the future of the industry, Grosch told attendees "your business can't wait for technology to slow down so you can climb aboard, because it ain't going to do it."

Grosch forecast further DP corporate deaths, such as Singer's, both in the U.S. and abroad. He did not give much hope for the stability of Siemens, Inc. and said Britain's International Computers Ltd. (ICL) is supported by a government which cannot even support itself.

"I am convinced that Japan is not losing ground in relation to the U.S. and that there is not a very big gap between the two," Grosch said.

The Japanese "could be competition to U.S. suppliers, but in order to do that they must do research and development now," he said.

They must maximize their untapped resources, such as women, in their research and management positions, Grosch said.

If all of these companies can remain alive and well, it might be possible to have a 50-50 split between them and IBM, he said.

"I hope the dwarfs don't line up behind IBM and follow [its] lead. If IBM comes out with some revolutionary development, they will be left completely behind," Grosch said.

"I think the biggest single element in the industry's future is IBM's decision to do something radical. If [it does], we're in serious trouble; if not, competition is possible."

Claims of Trade Secret Thefts Severed From Calcomp vs. IBM

By E. Drake Lundell Jr.
Of the CW Staff

LOS ANGELES – California Computer Products, Inc. (Calcomp) vs. IBM starting here next week [CW, Oct. 4] will be a pure antitrust trial without side issues such as theft of trade secrets, according to a ruling here recently.

Judge Ray McNichols severed IBM's counterclaim against Calcomp on the trade secret issue from the antitrust trial in a pretrial hearing, leaving only Calcomp's antitrust claims to be tried.

Both sides are now preparing for a jury trial of that issue.

The judge apparently felt adding the trade secret issue would prolong the trial and make it too complicated. While the antitrust case involves 1,100 documents and a relatively few number of witnesses, he noted, IBM had planned to use 11,000 documents and 129 witnesses on the theft of trade secrets claim.

The trade secrets issue will be held for a later trial.

At the same pretrial conference the judge rejected an IBM motion calling for a summary judgment in the antitrust case that would have found the firm not guilty of violations alleged by Calcomp.

In addition, he said Calcomp could bring up IBM actions in the systems marketplace as part of its case against IBM, but indicated he would give those actions less weight than the claims of illegal actions on the part of IBM in the peripherals marketplace.

Furthermore, McNichols deferred a Calcomp claim for $60 million in damages from IBM because of Calcomp dealings with BASF. He said those damages should be part of the international antitrust case Calcomp plans to bring against IBM in the future and not part of the domestic action.

McNichols also scratched a Calcomp claim for $10 million it said it had to pay in excessive interest charges because of IBM's alleged monopolization.

This leaves the Calcomp claims against IBM at about $100 million.

Since the judge has allowed Calcomp to include alleged IBM antitrust violations in the systems area in the trial, Calcomp will basically be presenting a capsule version of the U.S. government's case against IBM that is continuing to drag on in New York, observers said.

Correction

"Congressman Warns OTP Head Against Influencing AT&T Suit" [CW, Oct. 11] may have given the impression the White House Office of Telecommunications Policy (OTP) had taken a position opposing the government's antitrust suit against AT&T. In fact, OTP Director Thomas Houser said OTP has taken no position on the litigation.

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Control of Data Lies in Access: Lecht

By Catherine Arnst
Of the CW Staff

LAS VEGAS – The intent of privacy legislation should be to control the information being accessed, not the acquisition of that information, according to Charles P. Lecht, president of Advanced Computer Techniques Corp.

Lecht described the privacy issue to attendees at Info/Expo '76 held here last week as being part of a larger issue: centralization vs. decentralization.

"Centralization was an enormous issue in the '60s," he said, and privacy is "another manifestation of that issue."

Privacy, however, is an abstract issue to most Americans, he added, predicting only .5% of his audience had ever been affected by an invasion of privacy. Compared to the rest of the world, "personal freedom is still the best in the U.S.," he remarked.

CW at Info/Expo '76

A way must be found to make laws for everyone to obey that still protect individual privacy, and this is the paradox within the privacy issue, he noted.

Questions must be asked such as who will pay for privacy legislation and "how much do we need" before any laws can be passed, he insisted. The laws that are passed should not necessarily limit how much information is collected, but rather how much is given out and to whom, he added.

Balance Sought

Lecht seemed confident that, in America, a balance would be found between the right to privacy and the protection of business interests which would result in only a minimum of harm. The growth of business "is the American way" and should be protected as much as possible, he said.

One suggestion he made to ensure privacy legislation does not go overboard in protecting private citizens was directed toward the Data Processing Management Association (DPMA).

CW Photo by A. Dooley
Charles P. Lecht

DPMA's privacy committee should act as a clearinghouse for any privacy abuses that may occur so the extent of the problem can be properly judged, he said.

Such action "would save a lot of wasted time" because it could help prevent legislation from being enacted that would be unnecessary and overly burdensome for American business, he said.

N.Y. Taxing Software, Services

(Continued from Page 1)

for any taxes. However, it is the vendor's responsibility to collect these taxes, a vendor said.

While the Tennessee Supreme Court decided software is not tangible property and is therefore not taxable [CW, Aug. 30], this decision is not necessarily a precedent for other states unless they choose to make it so.

The New York State regulations specify software is tangible personal property and is thus subject to sales taxes. Keypunching and related activities are also taxable whether the customer or the service firm provides the media.

Contract programming, too, is taxable because it is a "service to tangible personal property" even if work is delivered to the customer on coding sheets to avoid the keypunch tax, according to a memo written by Francis Person, chief of the Instructions and Interpretations Unit of the Department of Taxation and Finance.

Information services are subject to New York State tax except when the "output is personal or individual in nature to the recipient and the DP company cannot or may not incorporate a substantial portion of the same information in reports which it furnishes to other clients," Person said.

"The processing of data may be completed with a 'canned' program owned by the processing company or the program can be furnished by the customer," he said.

Examples of exempt information services are accounting reports, accounts receivable and payable, sales analyses, inventories, payrolls and tax reports.

In addition, programming services to modify or update an existing program in order to meet new or additional processing procedures employed by the owner of the computer program are regarded as a service to tangible personal property and is subject to taxation, Person said.

But, despite Person's clarifications, the regulations vary regarding the sale of time.

For instance, in Example 8 of tax law 1101(b)(5), "A corporation contracts with a computer center to use the computer on the center's premises for 10 hours weekly. The corporation provides its own operation and its own materials. During the 10-hour period, no one else may use the machine. This constitutes a transfer of possession, pursuant to a rental, lease or license to use, which is a sale subject to tax."

In Example 9, "Same facts as in Example 8, except that the computer center provides and directs the operator. In this case, there is no transfer of possession to the corporation, as it has no control over the operation of the computer."

In Example 10, "Same facts as in Example 8, however, instead of [customers] sending an operator to the computer center, they have a terminal in their office which is connected to the computer center by telephone. This is a transfer of possession which is subject to tax," according to the regulations.

The latter example covers time-sharing services, a member of the task force said.

The LIBRARIAN® and MetaCOBOL® from ADR Boost Efficiency at Computer Power, Inc.

Computer Power, Inc., Jacksonville, Florida, provides complete data processing services for a number of banks, mortgage bankers and saving and loans whose mortgage portfolios have over 1,250,000 mortgage loans valued at over 24 billion dollars.

Over 8,400 program modules are now used to provide client services—modules which require storage space equivalent to 2.7 million card images.

Until The LIBRARIAN was installed, program storage and management was an expensive and time consuming problem

According to Technical Support Manager Roy Fileger, "Before we installed The LIBRARIAN, we stored everything on 17 IBM model 2314 disk packs. That meant we had 17 different source statement libraries. We were making 1000 pack changes a month and we were spending over 50 hours of computer time each month reorganizing files."

"Program standardization was a problem too. Programmers would make changes to one pack and not duplicate the changes on the other packs."

The LIBRARIAN enabled Computer Power, Inc., to cut disk storage by 94%.

After The LIBRARIAN was installed 2 years ago the entire source statement library was immediately compressed with the result that Computer Power, Inc., using the IBM 3330 disk system, now stores all of its 8400 program modules on a single disk, constantly on-line. The benefits were far greater than just the savings in disk use, however. Time required for file reallocation was virtually eliminated. Elimination of disk shutdowns and disk changes added another 50 hours a month of usable computer time. And standardization rapidly improved because common program changes no longer had to be duplicated on many different disks.

"We really have file backup now. And that's tremendous."

Roy Flieger remembers, "When we had 17 packs our backup and savings procedures were extremely time consuming. Now, with The LIBRARIAN and only one disk pack, we are able to save everything every single day in just 20 minutes."

ADR's MetaCOBOL is doing more than just conversion.

Computer Power, Inc., is in the final phases of conversion of more than 6000 program modules from DOS to OS/ANS. According to Roy Fileger, "We're running through MetaCOBOL and coming out with state-of-the-art programs, OS/ANS, single entry, single exit with I/O completely changed. All the programs we have converted so far have executed perfectly the first time."

Programs are being standardized as they go through MetaCOBOL.

"Everything coming out is looking alike. MetaCOBOL is picking up errors in violation of COBOL specifications that the compilers would let go through. As a result, our programs are really coming out clean," he continued.

"As far as I know, there is no alternative to MetaCOBOL."

"Any other system would have required hand-made changes involving a staggering amount of time," Roy Flieger added.

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Software Developers Charged With Misapplying Testing Time

(Continued from Page 1)

with 14% spent on coding and only 4% devoted to testing.

The project was completed in 61 hours, which means it was coded at a rate of about 20 lines per hour. The increased time spent on design resulted in a greatly reduced testing phase, he said.

Although this test program was relatively small, similar experiments with larger software projects have indicated the same type of benefits can be expected, Presser said.

In support of this concept, Presser contended "design creates order while maintenance [testing] creates disorder."

Projections in the growth of the computer industry indicate programmers become more scarce as the number of installed CPUs increases, he said.

In 1955, there were about 1,000 mainframes with 10,000 programmers. By 1985, there will be one million processors installed with 330,000 programmers.

This means the ratio of programmers to CPUs is dropping from 10:1 in 1955 to .7:1 today and to a projected .3:1 in 1985, Presser said.

CW at Info/Expo'76

"If you have a good programmer today, hang on to him or her," he advised.

Productivity Problem

The expected shortage of good programmers will be aggravated by the fact the university system is not geared to help produce good programmers, Presser said.

This year, the average programmer is producing about 1,100 lines of code per year while in 1985 it is projected a programmer will produce 1,500 lines of code per year.

Ways must be found to make these people more productive, Presser said, adding the reduction of time spent on testing would free more programming time for coding.

At the same time that productivity of programmers remains low, the relative percentage of DP dollars spent on software is increasing, he said. In 1955, 55% of systems costs were spent on software, today it is about 70% and, by 1985, it is estimated 85% of the costs of a system will be spent on software, he pointed out.

"When 85% of every computing dollar is spent on software, ways must be found to make it more efficient," he said.

Today's software problems are tied to the limited number of programmers, low productivity and poor quality of the programming effort, he said.

"There is very little discipline in software today," he added.

Next Generation Coming Soon

LAS VEGAS – The fifth generation of software, marked by integrated tools, data analyzers, documentation aids and methodology enforcers, will begin in the late '70s, Dr. Leon Presser, an independent consultant, told attendees at Info/Expo '76 here last week.

It will supplant fourth generation software, which began only about five years ago, with the first data base support systems, interactive programming and documentation aids, Presser predicted.

The development of translator writing systems and structured preprocessors will bring this period to a close, he said.

Outlining the development of software from the early '50s when Univac I was announced, at that time software was characterized by assemblers and subroutine libraries, Presser said.

In the late '50s, the second generation began with the advent of Fortran I as a higher level language. This period also saw the start of leaders, linkers, editors and debugging aids, and software utility packages emerged, he recalled.

The third generation of software development began in the early '60s with the advent of operating systems and carried over into the middle of the decade with new, higher level languages and time-sharing conversion aids, he said.

Performance monitors were developed during the late '60s along with application-oriented software aids.

IBM Enhances 370/158 System

(Continued from Page 1)

essor, the current 158 user upgrading to the APS would need to obtain a remote system console primarily for diagnostics and an attachment feature which provides storage protect capabilities, the spokesman said.

A 4M-character APS without I/O equipment except for the necessary processor attachment costs $75,065/mo. The previous upgrade path, a multiprocessor configuration with 4M characters of storage shared between two processors, costs $102,630/mo.

The IBM spokesman pointed out this comparison does not take into consideration the software performance or increased number of channels available on the multiprocessor configuration..

The 158 APS is supported in multiprocessing mode by OS/VS2 MVS, IBM said. In addition, IBM announced VM/370 support for both the 158 APS and 168 APS to allow concurrent execution of tasks within the two instruction processors.

Extended Memory

The larger main memory capacity announced for the 158 "will enable users to keep more information available for processing at any given time," IBM said. Memory can be added in 1M-character increments to allow either 5M characters or 6M characters to be accommodated.

The maximum main memory capacity for multiprocessor configurations remains 8M characters, the spokesman noted, and it is possible for some users to have asymmetrical configurations.

The additional memory can also be installed in the field, he said, adding field engineers can make the upgrade by adding memory boards and changing some hard-wired addressing functions.

The larger memory for the 158 will be available in the second quarter of 1977, IBM said. Monthly rental for the 158-3 CPU with 5M characters is $70,010; it can be purchased for $2,794;100. The 158-3 with 6M characters costs $75,910/mo or $2,964,100.

Current 158-3 users can have the memory upgrade for $5,900/mo per million characters. The upgrade may be purchased for $170,000.

Time for Upgrade

It takes about 40 system hours to upgrade to the APS, a spokesman said. About 16 of those hours are needed to upgrade the CPU to accommodate the second processor and 24 are reserved for the actual addition of equipment and debugging.

The work can be done on two separate weekends, IBM said.

The APS and field upgrades will be available in the summer of 1977, IBM said. Monthly rental for the APS system will range from $52,965 with 512K characters of main memory to $91,205 with 6M characters of memory.

The systems can be purchased for $2,300,100 to $3,427,400, IBM said.

Insurance Investigators Indicted

(Continued from Page 1)

Internal Revenue Service (IRS) in a similar manner, the Goldwater aide said, noting the training booklet cited a "confidential source" in the IRS office in Kansas City.

Factual employees were instructed to obtain "line by line" details from individuals' tax returns, he said, adding information on Social Security payments was also obtained.

The FBI refused to comment on the ease with which Factual employees were able to sidetrack the FBI's security system.

An IRS spokesman said it was "highly unlikely" personal taxpayer information was obtained from the IRS in view of the penalties dictated by the Privacy Act.

"If it did happen, we would have no way of knowing it," he noted.

The IRS is aware of the allegations, however, and an internal investigation has been initiated, he added.

Goldwater's staffer expressed concern over the position of the insurance companies in this matter, especially in view of all the fraudulent claims filed against them.

"We feel that's the reason a lot of these companies have been going after this data," he said.

The investigation began in September 1975 and Tooley took the problem to the grand jury a month later.

Last June, the grand jury obtained a court order to release certain exhibits and transcripts to the Privacy Protection Study Commission in Los Angeles.

Navy Locates Jet Fighter

WASHINGTON, D.C. – The U.S. Navy has found the F-14 Tomcat jet fighter which plunged into the Atlantic Ocean 75 miles west of the coast of Scotland in mid-September.

The Navy had stepped up the search in past weeks for the $14.3 million top-secret aircraft equipped with advanced computer and electronic navigation weapon systems by sending three ships to the site, according to a spokeswoman at the Naval Air Systems Command.

The plane was found under about 1,900 feet of water, sources said. It sank after it missed the catapault of the aircraft carrier John F. Kennedy and hit the water beyond the flight deck [CW, Sept. 27].

The Navy will not comment on the possibility a malfunctioning computer system caused one of the F-14's two engines to race out of control until it has examined the plane, she said.

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MRI Shows DOS/VS System 2000

TCI, IBM Terminals Among Debuts Made at Exhibit

By Ronald A. Frank
Of the CW Staff

LAS VEGAS – More than 40 exhibitors displayed products and services at Info/Expo '76, the 25th annual conference of the Data Processing Management Association (DPMA) here last week.

Terminal Communications, Inc. (TCI) of Raleigh, N.C., introduced an intelligent programmable terminal system with a dual microprocessor controller, up to 1M byte of floppy diskette storage and as many as three CRT terminals.

Called the Remote Access Communications Terminal (React), the system can operate in binary synchronous communications mode, Teletype mode and other modes to transmit data in an existing network, TCI said.

A typical React configuration including 16K of memory, 250K of diskette storage, keyboard CRT and printer costs $12,900 or $400/mo on a two-year lease. Maintenance costs $85/mo, a spokesman said.

TCI also introduced several enhancements to earlier terminals including a Synchronous Data Link Control (SDLC) capability for the TC 241 keyboard printer, TC 271 control unit and TC 275 keyboard CRT.

The feature for the TC 271 provides capabilities similar to the IBM 3271 and costs $1,000 or $50/mo with maintenance. The TC 275 feature is similar to the IBM 3275 and costs $575 or $40/mo with maintenance, and the TC 241 feature, similar to the IBM 2740 and 3767, is priced at $800 or $30/mo with maintenance.

The SDLC capabilities are field-installable on existing TCI terminals and will be available in April, except for the TC 275 feature, which is scheduled for June, the firm said.

MRI Systems Corp. showed a DOS/VS version of its System 2000 data base management system. Designed for DOS users of smaller systems such as the IBM 370/135, the software is said to run in 40K bytes of storage.

CW at Info/Expo '76

The basic system will include such options as a query/update language, host interfaces to Cobol, Fortran and PL/1, multiuser multithread capabilities, an integrated report writer and an interface for IBM's CICS.

The basic software for DOS/VS users costs $30,000 and will be available next month, a spokesman said.

IBM demonstrated a 120 char./sec version of its 3767 terminal at the show. The Model 3770 was shown in both dial-up and private-line versions receiving data from an IBM 370/168 at the IBM Data Center in Los Angeles.

The 168 operated under MVS/TSO and included a 3705 running with Release 4.1 of the Network Control Program, an IBM spokesman said.

The IBM 3770 was also demonstrated in a stand-alone configuration using an order entry program loaded into diskette storage on the system.

About 2,000 users attended the three-day conference. The 1977 Info/Expo conference has been scheduled for Oct. 9-12 in Washington, D.C.

CW Photo by A. Dooley

Frank S. Figearo (left) and Richard D. Balfour took a look at the CTI React system when they visited the Info/Expo exhibit floor last week.

Awad Sees Phaseout Of Programmers Now

By a CW Staff Writer

LAS VEGAS – In-house programmers are being phased out in favor of systems analysts with a strong background in one or more programming languages, according to Dr. Elias M. Awad of Ball State University.

Awad's research has shown a decreasing emphasis on in-house programming because of the increased availability and "popular use" of software packages and preprogrammed, ready-to-use applications packages from both mainframe vendors and independent software houses, he told an Info/Expo '76 session here last week on job satisfaction in the DP environment.

Major applications such as payroll, accounts receivable and payable and inventory control with updates routines are now economically available. This leaves in-house programmers working primarily with "special-purpose, one-shot applications and systems maintenance routines," Awad said.

High Turnover Rate

Awad's findings were based on a study of 50 programmers and 36 systems analysts in the DP department of a large petroleum company. In many cases, those hired as programmers were expected to advance into systems analysis within six to eight months, he said.

The average firm experiences a 30% to 40% turnover in DP personnel because of voluntary resignations each year, Awad noted. Lack of internal opportunities for promotion, involvement with routine tasks, limited participation in task-related decisions and inadequate fringe benefits were the main reasons for this turnover.

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Privacy Law Called Necessary To Cover Records Used in EFT

(Continued from Page 1)

The witnesses were also asked to assess the legitimate uses of EFT information by the government.

The issue at present is one of "transition," or how American society should approach changing from existing financial payment systems to more automated systems, Westin told the commission.

This is necessary since there is no official EFT plan to assess, although society is undeniably moving toward various "less-check" and "less-cash" arrangements, he noted.

Disagreeing with those who propose a simple extension of current confidentiality policies by financial institutions, credit card firms, retail establishments and commercial reporting agencies, Westin said when, as in EFT, personal information is merged from a variety of present sources to create and maintain a permanent financial transaction data base and network, a new trustee relationship has been created between the system's managers and the individual account holder.

"Under this conception, the data-rich profile of an individual residing in the EFT data base would be a valuable legal property belonging only to the individual account holder and not to the system," Westin said.

The system managers should be allowed to use the information solely for purposes of funds transfer and its necessary monitoring for security, audit and other protective purposes, according to Westin.

"However, any commercial or other gainful use of an individual's transactional history represents the taking of a valuable property right for which both compensation and consent are required," he said.

In cases of government access, Westin proposed any law enforcement inquiry involving inspection of EFT records directly related to First Amendment-protected activity (religion, speech, assembly and, especially, records of private associations) would be presumptively improper.

Charles C. Marson, legal director for the American Civil Liberties Union Foundation of Northern California, said both the Supreme Court's upholding of the Bank Secrecy Act and the California Right to Financial Privacy Act, which will go into effect Jan. 1, are directly applicable, in theory, to records of EFT transactions.

The federal law is based on the notion that the holder of the records, rather than the subject of the records, owns them and, therefore, the subject has no constitutional right to assert, according to Marson.

"The California rule, both by statute and decision, follows the premise that the privacy interest belongs to the customer, not the record custodian, and the customer must therefore receive notice of attempted access to those records and have a fair opportunity to resist it," he said.

However, EFT records will contain far more information than does a record on a check drawn on a bank, he noted.

EFT records will provide information almost instantaneously, while substantial time may pass before bank records will yield desired information.

Further, data generated by EFT may be much more readable and, therefore, more accessible than records such as bank checks, he added.

Marson also supported statutory protection of EFT data.

Not Unduly Concerned

Carol S. Greenwald, commissioner of banks for the Commonwealth of Massachusetts, was not unduly concerned over privacy issues.

If information in an EFT system is accessible only by using a plastic card or personal identification number (PIN) known only to the individual, privacy would not seem to be compromised because the individual's bank doesn't need to know the PIN after the card is issued, Greenwald said.

"Under such an arrangement, a merchant desiring data could request it electronically, but only with the customer's card or only if the customer punched in the appropriate code.

However, Greenwald did agree with earlier witnesses that an EFT system will make it possible to collect and store data about any individual's or company's behavior, vis-a-vis financial transactions, more easily than ever before.

Diametrically opposed to Westin, Barry I. Deutsch, vice-president and director of marketing for Provident National Bank in Philadelphia, stated "consumer concern over privacy is often misinterpreted by researchers and consumer advocates."

Privacy is a marketing problem, not a regulatory one, he said. "Moreover, it is a problem for a certain segment of the public that will never be resolved, thus mandating the continuation of the paper-based payment system," he added.

Deutsch based his arguments on a study which showed consumers were adverse to direct payroll deposit because it removed their control or because they like to deposit payroll checks themselves.

There was no mention of privacy concerns, he said.

Privacy Hearings Extended

WASHINGTON, D.C. – The Privacy Protection Study Commission will hold two additional days of hearings on the recordkeeping practices of educational institutions on Nov. 11-12 here.

The hearings will be held in Room 2358 of the Rayburn House Office Building on Independence Ave. S.W. from 9:30 a.m. to 5 p.m. on Nov. 11 and from 9 a.m. to 5 p.m. on Nov. 12.

The commission will focus on the practices of postsecondary institutions, organizations maintaining personal records related to school admissions or financial aid, the Department of Health, Education and Welfare resources and strategies for implementing the Family Educational Rights and Privacy Act (Ferpa) of 1974 and the development of statewide or regional computer-based information systems for auditing, eligibility determination or provision of special services in schools.

Additional information on the hearings is available from Carole Parsons, executive director of the commission at 2120 L St. N.W., Washington, D.C. 20506.

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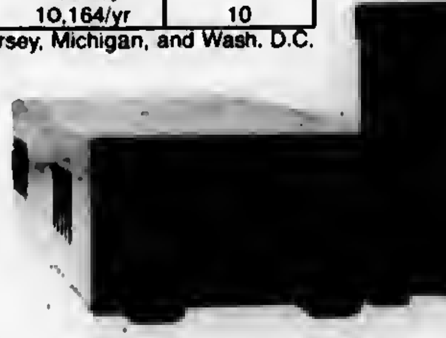

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Senate's Productivity Growing With DP Applications

By Ronald A. Frank
Of the CW Staff

LAS VEGAS – The U.S. Senate is well on its way to making its work more productive through the use of computerized applications, according to Sen. Howard Cannon (D-Nev.).

Delivering the keynote address at the opening session of Info/Expo '76 sponsored by the Data Processing Management Association (DPMA), Cannon said the Senate has several applications already operating.

The Senate Post Office, which receives about one million letters per month, uses "prearranged text-specific answer" letters to constituents to reply to correspondence sent to members of the Senate.

A computer is used to compose "prepersonalized letters" using position papers presented by a senator on a specific issue, Cannon said.

These computerized letters will later be followed up when a vote is taken on the issue so constituents can be kept informed of progress being made.

Cannon, chairman of the Senate Subcommittee on Computer Services, said the computer has also been used to develop a data base of pending legislation.

In 1976, 1,500 measures were introduced into the Senate and more than 10 times that number were introduced into the House. About 250 of these proposed bills were passed; the rest were referred to a committee or subcommittee.

The Senate has 32 standing committees and 140 subcommittees and the data base is being developed so senators and staff members can track the progress of specific legislation through the legislative process, Cannon said.

Information in the data base will be called up on terminals and all the information reported during the day "will be available and fully processed in the data base the next morning," he said.

The subcommittee is also developing a computerized model of Senate committee assignments to see if any changes should be made, Cannon said. At present, the 100 senators have an average of 20 committee assignments, which often makes it difficult for a member to be everywhere he should be.

The Senate is "a very sensitive organization" and its procedures have been built up slowly so care will have to be taken to ensure the computer "does not run away with our processes" and do things that go against reason and careful judgment, Cannon told attendees.

CW at
Info/Expo '76

Badly Planned Privacy Proposals Should Be Fought, Lawyers Say

By Catherine Arnst
Of the CW Staff

LAS VEGAS – No one in his right mind would oppose privacy legislation; what should be opposed is poorly planned and enacted legislation, a panel at Info/Expo '76 here last week agreed.

"Bills are going down the tubes because of poor planning," John C. Lautsch complained. Lautsch is counsel for the California State University and Colleges.

"Legislation is supposed to be a solution to what is perceived as the privacy problem," William A. Fenwick added. The partner in Davis, Stafford, Kellman and Fenwick said, however, there also must be protection from overzealous privacy proponents.

The government needs to share data in order to work and a lot of good can come out of the massive amount of what may seem like unnecessary data collected by such agencies as the Census Bureau, Fenwick said.

However, the government can also destroy a person by selectively reporting that same information, he warned. The country became aware of this potential threat after Watergate, when the social issue of "what should be done about the collection of private information" became a major national concern, Fenwick said.

One result of this concern has been a plethora of privacy legislation; in 1975, 39 states had such proposals covering both public and private sectors, he said.

The federal Privacy Protection Study Commission is studying the problem, but the commission's charter is so broad "it can't possibly carry out its mission," Fenwick said.

"To a world enamored of computing, everything has come to look like a DP system" and people are viewed as only one more type of information-processing system in the name of privacy, he said.

Lautsch warned that organizations cannot be treated as nothing more than information-processing systems. Legislation must take into account that not all organizations are homogeneous, and provisions must be flexible enough to provide for a variety of administrative and organizational formats, he said.

Legislation also cannot apply the same procedures to a multipurpose organization, such as a university, and a single-purpose one, such as a motor vehicles department, he cautioned.

The largest problem with privacy legislation proposed to date, however, is the imprecise and broad language which makes it next to impossible to comply with the regulations, Lautsch said. This is partially attributable to a lack of thorough understanding of what is needed, he added.

Purdue University is offering a possible solution to that lack of understanding with a newly created Privacy Information Research Center.

Two projects already undertaken by the center include a cost model related to privacy legislation and a study of societal attitudes toward privacy, particularly white-collar attitudes toward corporate recordkeeping, according to its director, Jack Osborn.

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Bulging Wallets Seen From Split in Encoding Practices

By Edward J. Bride
Of the CW Staff

HOUSTON – The divergence of encoding standards for credit/debit cards in the retailing and banking fields may prevent the consumer from ever reducing the number of cards needed for credit transactions, according to a representative of Sears, Roebuck & Co., one of the nation's largest retail outfits.

"There is no communication between the two segments" of the credit industry, Randolph Lively noted during a panel discussion held at the annual conference of the Association for Computing Machinery (ACM) here recently.

Financial institutions want their debit cards to have a magnetic stripe, but the point-of-sale (POS) scanning equipment which Sears and other retailers have adopted relies on optical codes, either human-readable (for most retail systems) or barcoded (in grocery stores), Lively noted.

"The POS scanner is cheap," he said, adding the product tags are "cheap to encode" and also secure.

Lively also contended "consumers will like [electronic funds transfer (EFT)] once they understand it," and after the proper job has been done in security and privacy. This accomplishment is "some years off," he added.

Responding to a question from the floor on whether Sears would accept magnetic stripe cards, Lively said, "I doubt seriously" that this would happen because of Sears' investment in scanning equipment.

Part of the security/privacy problem stems from the fact that there are "no standards for the personal service of programming," according to Bob Abbott of the DP Audit Division of Tymshare.

Abbott, who formerly administered a research project in secure operating systems at Lawrence Livermore Laboratories, said "program proving is far away" and programs should be examined from the more troublesome perspective of "what a system can be made to do, rather than what it was intended to do."

CW at ACM

Roland Eppley, president of the Eastern States Bankcard Association, added "EFT is a technology looking for a market.

"Which comes first, the technology or the demand?" he asked. It is difficult to ask people if they would like something they never had before, he said.

To further complicate this matter, Eppley noted "every study we have ever done on EFT shows there is no profit." Companies, banks and retailers are contemplating EFT now as a defense against losing customers, he explained.

Eppley predicted an insufficient expansion of this market, with concomitant shifts in market shares by banks. There will be downward pressure on interest rates and profitability, he added.

"Perhaps 5,000 of the 15,000 commercial banks will disappear" over the next five to 10 years, he said.

Banks are now reappraising their interest in "retail banking" and its return on investment, he said.

Users Faulted On DP Selection

By a CW Staff Writer

HOUSTON – One reason computer users don't get what they want from their computer room is that they don't know what's going on outside it.

That was one conclusion reached at a technical session on the selection and evaluation of computer systems and services, during the recent national conference of the Association for Computing Machinery (ACM) here.

This lack of knowledge includes activity on terminals, the unpredictability of the work of programmers and shortcomings in the discipline of benchmarking, panelists contended.

There is a tendency, for example, to use the process of "mathematical induction" in planning for terminal networks, according to James Cameron of Denison University.

"We say if something works with six terminals, it will work for seven, and if it works for seven, it will work for 100." This is faulty reasoning, Cameron explained.

Furthermore, most users don't know what is going on at the terminals, he said, using the percentage of time on program checkout vs. productive work as an example. This leads to trouble writing system specifications, he noted.

"There is a 100% probability you will not get what you want" when this situation exists, he continued. "You'll pay more than necessary, which is a minor detail, but you will not get what you want."

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Computerworld 11-1

Small Businesses 'Scared Off'

People, Politics Called Dampers on Spread of Minis

By E. Drake Lundell Jr.
Of the CW Staff

HOUSTON – People and politics will be the limiting factors in the spread of minicomputers into smaller companies and organizations, according to panelists at the recent national conference of the Association for Computing Machinery (ACM) here.

"Who is going to do" the systems and programming work for the smaller companies? Prof. Ted Cary of Wichita State University asked.

"I don't see any students being trained to help the small businessman," he added, claiming a "good portion" of the people already in this area are "basically frauds."

Many small businesses were basically happy with "well-thought-out and well-honed" manual systems and turned to computers only when they grew to the extent they felt the firm was getting out of their control, he said.

CW
At ACM

The cost of planning and implementing such systems was "often misunderstood and underbid," he said, but added the small business world would not be "scared off" from computerization if told the true price from the beginning of a project.

Another panelist, D.E. Schilling of Arbat Systems Ltd., said many of the smaller organizations are put off by the mystique of computing and the jargon that goes with it.

There is no need to hide behind this mystique with minicomputers, he said, since such systems should be used to solve business problems and the emphasis should be on that rather than on bits and bytes.

As mini systems are pushed out into using departments, people are more dependent on them than they are in the batch-type shops, he noted, which means the systems have to be more reliable and "idiotproof."

The documentation also has to be "idiotproof," he added, because the systems will be used by people unfamiliar with operating systems and languages.

'Fire the DP Department'

Elizabeth Rather of Forth, Inc. noted the use of minicomputers is narrowing the gap between the top management of a company and that company's DP personnel.

Previously, she noted, management had to turn over the company's information to DPers "who speak a different language," and this prevented a lot of computer use.

This has changed with the mini, she said, because users "can get systems they understand – particularly programmerless systems."

Small businesses – and perhaps larger ones as well – should "fire the DP department," she contended.

If a firm did this, the top management would "find out what has been going on – discover the inanities" in the present systems, she said.

With such a move, programmers would be forced to write programs for users and not for other programmers, she added, because they would be forced into the user part of the organization.

Today, Rather contended, the job security of a programmer "depends on not finishing the job" because a programmer is rarely fired in the middle of a project.

If there were no DP department, just the opposite would happen, she said. Programmers would write good code, provide good documentation and do the job right the first time, she claimed.

On the other hand, Peter van Berkel of Consultdata Nederland said minis are giving users more motivation to use computers because they can work with the systems without having to go through a DP department.

Technology is no longer the driving force for either decentralization or centralization, he added, explaining adequate technology is available for both types of management.

But the idea of decentralization often raises the fear on the part of managers that they are losing control over their operations and does open the door to the possibility of poor or unauthorized use of systems, he said.

Because of this, minis should not be introduced as part of unplanned growth of DP, he said. A strong central authority should still be in control of DP to plan the use of systems and to keep from "reinventing the wheel."

"Sycor service keeps my network uptime to 98.5%."

Bill Dierkes, VP Information Systems,
The Keebler Company.

The Keebler Company, second largest producer of cookies and crackers in the U.S., has six bakeries and 63 distribution centers serving 90,000 retail outlets. Keebler's sales force of more than 1200 used to mail 40,000 orders per week to the 63 distribution sites, where processing and invoicing were done manually. The problem was, these orders weren't getting processed fast enough.

The installation of Sycor intelligent terminals changed all that. And established a new set of order processing standards. Operating at peak efficiency, invoices are now transmitted from the CPU back to the branch locations the same day orders are received. Keeping up this level of performance demands terminal and service reliability.

Keebler puts Sycor to the test.

After a year of operation, Information Systems VP Bill Dierkes wanted to know how reliable Sycor terminals and service were.

"I conducted a survey of 61 of our Sycor terminals from December, 1975 through May, 1976. Some of the terminals were in out-of-the-way places like Minot and Fargo, North Dakota; Billings, Montana; and Pocatello, Idaho. Places where service might be a problem.

"What I found out really amazed me. Naturally I expected the terminals to be reliable, and I expected Sycor to back them up with good service. But even I was surprised to find that, when a station went down, *80%* of the time it was back up again in four hours or less. And *95%* of the time in eight hours or less.

"When you consider that each location uses the terminal an average of eight hours per day and that there are 127 working days in the six-month period surveyed. the total system was up 98.5% of the time."

A Sycor intelligent terminal is a management tool.

Beyond fast maintenance and reliability, Bill Dierkes has found many other benefits from his network of Sycor intelligent terminals.

"Price, ease of installation and the Sycor terminal's ease of operation were other factors I considered. But the real benefits emerged when the system was installed. As soon as it was up and running we were able to reduce order processing labor by 75%, inventory by 15%, and process 40,000 accurate invoices per week. My Sycor system is a real management tool.

"We're extremely satisfied at Keebler with the overall performance of Sycor terminals. And the people responsible for maintaining them."

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If the card is gone call one of our nearby sales offices. We're listed in the Yellow Pages under "Data Processing Equipment." Or contact Bill Newell, our national sales manager, at Sycor, Inc. Corporate Offices, Ann Arbor, MI 48104.

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Editorial

What's the Point?

Seven top IBM executives – including the corporation's board chairman, Frank T. Cary – were brought into court under subpoena by the U.S. government to testify in the trial of its antitrust suit against IBM. But they never took the stand [CW, Oct. 25].

None of the seven knew anything about two IBM internal documents the government hoped to put before the court as evidence the corporation tried to lower its market share estimates when it became apparent the Justice Department would bring IBM into court on charges of antitrust violations.

The Justice Department believed the action was ordered by the judge. Even without this sanction, the government's move might have been viewed as "a bold stroke" had its attorneys not been told by IBM counsel the day before that the seven executives knew nothing about these two exhibits.

Ever inflexible and unimaginative in their approach to the trial of this massive suit, the Justice Department lawyers had them come to court anyway.

Certainly, the government attorneys might have been concerned they would not get *any* of the information they sought regarding these documents. Calling Cary and the other men could have been viewed as a club over IBM counsel's collective head – ready to fall should the defense fail to provide the needed information.

But the government should have been prepared to follow through by having each IBM executive climb into the witness box and state for the record he knew nothing about either document.

What of IBM counsel? Didn't these attorneys have a responsibility to minimize the waste of resources the government subpoenas precipitated? Couldn't lead attorney Thomas D. Barr have told the judge the effort to bring people from Paris and Minnesota, as well as Armonk, N.Y., would be futile?

Like the government lawyers, IBM's attorneys acted in this instance as they have in the past – only more so. Though representing the defense, they took the offense. Normally not a bad approach, this time it seemed overdone.

Barr hauled people and paper into court to prove one point in particular: IBM shouldn't have to do *all* the government's work – considerable and difficult though the effort may be – for it. While the attorney may have succeeded in illustrating this position, it is doubtful whether it will make any difference.

And what of the judge? He, too, responded predictably.

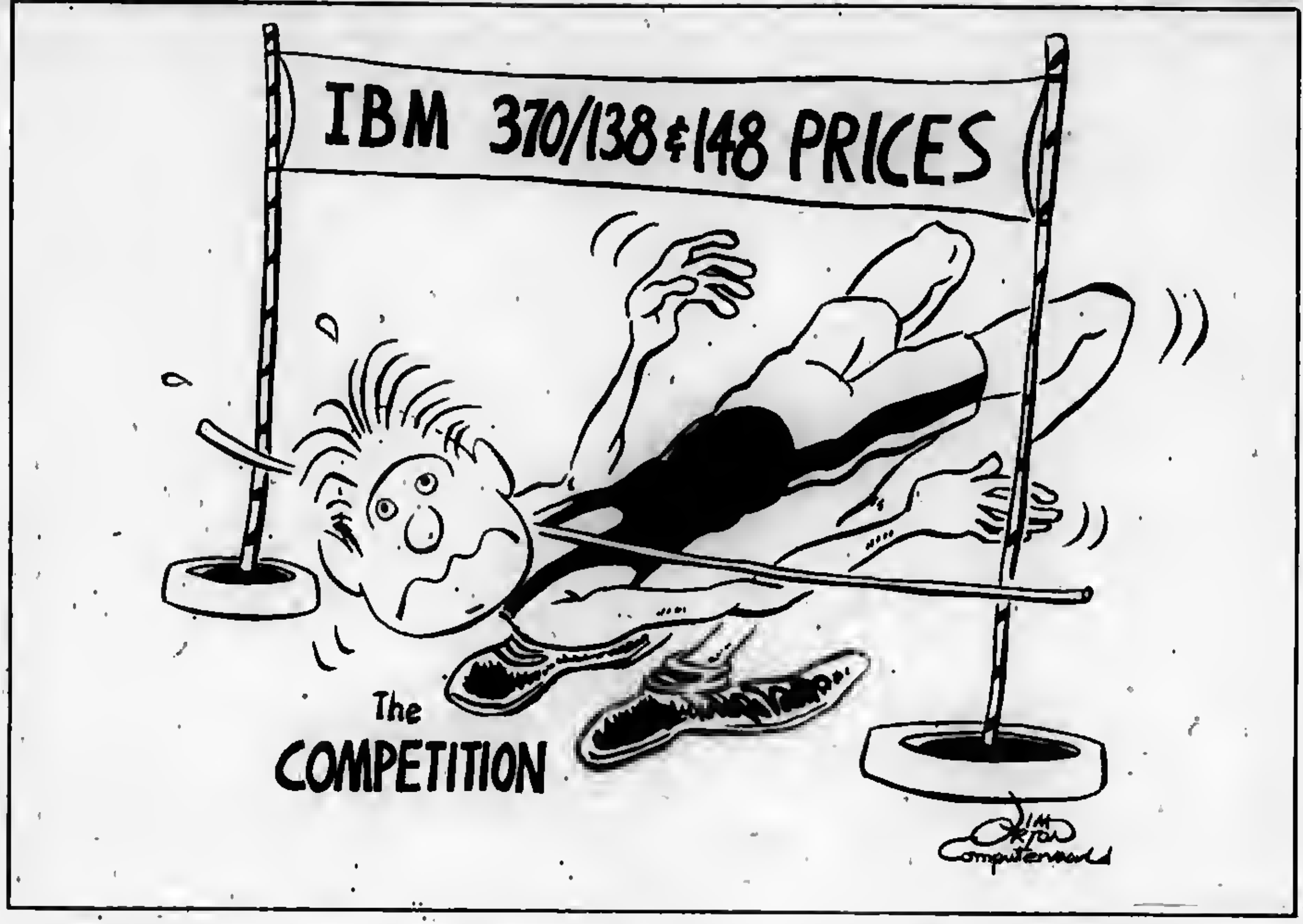
Watching this spectacle from the bench, Judge David N. Edelstein told the parties he had ordered members of the IBM executive suite to appear *only* if the parties couldn't agree on the foundation behind the documents in question.

Trusting the advocates to choose the "reasonable" solution to the problem of who authored these documents and why, Edelstein made it clear he did not expect the government to take this step.

After 25 years on the bench and over four years of close contact with these parties, Edelstein should have known better.

The animosity between the IBM and government attorneys is too great; the stakes in this suit are too high to permit cooperation in this litigation. It's long past time that the judge took charge of this trial and ran it to some conclusion.

U.S. taxpayers now owe witness fees and travel expenses to each of these men. What was the point?



Letters to the Editor

Carter Coverage Gives Impression Of Cheap, Partisan, Political Shot

"DP Catches Carter Contradictions" [CW, Oct. 18] was imprecise and, therefore, distorted. It left the impression of a cheap, partisan, political shot.

The article purported to detect discrepancies in Presidential candidate Jimmy Carter's statements on the "right-to-work" section (14B) of the Taft Hartley Act.

The article indicated candidate Carter said:

- He had not advocated repeal of Section 14B.
- He would (when he was governor) have signed the repeal if it had passed the Georgia Legislature.
- He thought 14B should be repealed.
- He would not campaign for repeal of 14B but would sign such a repeal if it passed the U.S. Congress.

If one examines what was said, one will find consistency, not discrepancy. It is possible to favor repeal without giving high priority to the effort needed to campaign for it. It is also consistent to be willing to approve the repeal if those who give it a higher priority are able to get approval by Congress.

Carter's statements are consistent. They also indicate an analytical thought process capable of establishing priorities and conserving energies needed to focus on highest priorities.

Albert Mendall Jr.
Hyde Park, Mass.

Article Seems to Aid Ford Camp

"DP Catches Carter Contradictions" seemed to me to politicize *Computerworld* to the benefit of the Ford candidacy.

What is the *Gastonia Gazette* and what is its political preference? Who placed this article in CW? Was this done to hinder the campaign of Jimmy Carter?

Where are the discrepancies on Gerry Ford's positions in recent years? Perhaps they could start with the statement he made that he would not run for President if he were confirmed by the Senate during his Vice-Presidential hearings.

Tracking a candidate's position over time makes an interesting exercise, but it should be applied to both candidates, not just one. Otherwise, it should not be published by CW, which I assume holds an independent position in the forthcoming election.

John J. Cullinane
Wellesley, Mass.

DG Advertisement in Good Taste

After carefully reading and rereading Robert D. Tennyson's comments on the term "Mother" [CW, Oct. 10] as referenced in Data General's (DG) Eclipse C/300 ads, I've come to the conclusion Tennyson is obviously not familiar with the industry's list of colorful nouns when relating to IBM (the company, not the hardware).

I think the DG ad was in good taste as well as being to the point. We can only hope Tennyson goes on just "looking at the pictures" and dares not read the communications section. "Ma" Bell, Tennyson, is also not meant as a slur.

Fine work, *Computerworld*, for publishing such thought-provoking ads.

Bruce R. Wiens
San Francisco, Calif.

Data Past

Five Years Ago
November 3, 1971

SAN FRANCISCO – An attempt to stall RCA contract certification until the company agreed on higher levels of support was made by the RCA Computer Users Association (CUA). Delegates representing over 25% of RCA's users declared they would refuse to recommend to their managements a settlement with RCA unless it agreed to the support requests made during CUA meetings.

– – –

LOS ANGELES – A human error on a municipal computer tape necessitated mailing corrected tax bills to 230,000 residents of this city at a cost to county tax assessors of about $50,000. It was only by chance the error was discovered, avoiding the "monumental" problem of overpayments that could have totaled as much as $15 million or $50 per taxpayer, according to the city's Data Service Bureau director.

Eight Years Ago
October 30, 1968

WHITE PLAINS, N.Y. – IBM announced four of its 360 systems were taken out of "full new production." A continuing supply of the systems would be assured by returned, reconditioned equipment which IBM warranted as equal to new machines in performance and price, a spokesman said. The move resulted in increased rental, purchase and leasing costs by eliminating the federal tax credit. It was not clear at the time whether the IBM action was dictated by a growing surplus of returned machines or a sign that production was being phased out to make way for production of later versions of the affected models.

– – –

WASHINGTON, D.C. – The Justice Department and the Electronic Industries Association joined the fight against the revised foreign attachments tariff scheduled to go into effect Nov. 1. Justice opposed the provision that would allow AT&T to force the use of its own network control and signaling devices. The department contended the restrictions ran counter to the Federal Communications Commission's decision in the Carterfone case, in which it threw out the foreign attachments tariff.

Contracting With IBM May Be Cheaper in Short Run

By James H. Conole

Special to Computerworld

The Itel Corp. IBM 370/158-compatible system [CW, Oct. 18] has given the 158 user a choice similar to that offered to the 168 user by Amdahl Corp. a year ago. Since price/performance is the principal reason for moving to a non-IBM CPU, it is very important for the user to be able to assess this ratio as realistically as possible in deciding between an IBM CPU or an emulator from another firm.

I will not attempt to discuss the performance factor, as the user can estimate this based upon tests and benchmarks he can run himself. I wish to address the element of price which cannot be determined by merely comparing IBM's list purchase price against Itel's or Amdahl's.

The true cost of a system is determined by the length of time the user expects to use it and the residual value of the equipment that remains when he no longer wants it in his shop. The user who plans to keep the system only a few years will find going with IBM is cheaper than purchasing or leasing either the IBM or the non-IBM CPU from a third party.

For the user interested in keeping a system three years or longer, the purchase or third-party lease of an IBM system becomes progressively cheaper than a direct IBM rental and can be compared favorably with a purchase or third-party lease of the non-IBM alternative.

Residual Assumptions

Based on 11 years of experience with the 360 generation and more than five years with the 370 generation, we believe the residual value of IBM 370s can be tied to delivery dates of its next generation of machines.

Assuming IBM will be shipping its next generation systems in quantity by the end of 1979, we can estimate the 158s and 168s (Model 3 version) will be worth 50% by then, 35% one year later and 25% two years later.

The 370 values are enhanced by the effect of inflation and the fact that memory prices at the end-user level are not dropping as sharply as they did during the past generation.

Using these assumptions, we can take a typical 370/158 Model 3 with 2M-byte memory, five channels and a console and compare it to a similarly configured Itel AS/5 to show in a shorthand manner the effect of residuals on effective cost.

IBM's Monthly Availability Charge (MAC) price on the 158 is $52,589, and the list price is $2,419,445. Assume the Itel price is 75% of IBM's since a price list has yet to be published.

To discount the residuals and compute equivalent monthly rental prices, use a 10% interest rate, which is above the borrowing cost of most users but below their average cost of capital. Note that we are determining an effective monthly charge even though the equipment is being purchased by the user.

Assumed Retention Period	Three Years		Four Years		Five Years	
	IBM	Itel	IBM	Itel	IBM	Itel
Estimated Residual Values	50%	20%	35%	10%	25%	10%
Present Value of Residual	37.1%	14.8%	23.5%	6.7%	15.2%	6.1%
Net PV Cost of CPU	62.9%	85.2%	76.5%	93.3%	84.8%	93.9%
Net Monthly Charge (% x List)	2.03%	2.75%	1.94%	2.37%	1.80%	2.00%
IBM $/mo	$49,115		$46,937		$43,550	
Itel $/mo		$49,900		$43,005		$36,203
% Savings on Itel CPU		−1.6%		8.4%		16.9%

IBM vs. Itel Price Comparison

Reader Commentary

As we can see from these assumptions, the Itel system is more expensive if the user expects to keep the processor only three years. In fact, for a three-year expectation, a user in most states would probably sign an IBM 48-month contract at $47,856 and pay the three-month penalty upon termination.

The principal advantage of a purchase in this case would be the ability to use the full investment tax credit (ITC), even though it will be partially recaptured in the future, and the avoidance of future IBM price increases (except maintenance).

On four- and five-year assumptions, the Itel purchase becomes progressively cheaper than the IBM purchase, but at no time does the effective monthly savings percentage equal the percentage discount quoted on the purchase price because of the higher IBM residual expectation.

The residual assumptions for the Itel equipment obviously have a major effect on the comparison and must be discussed further. In fact, there is a realistic possibility that any non-IBM equipment (not just Itel or Amdahl) will have very low residual values almost immediately because there is no assured support for the equipment for a second user of a system.

Because Itel and Amdahl retain no residual interest in the equipment, their motivations are not aligned to retention of ordinary residuals we can expect from IBM equipment. In fact, when a vendor is unwilling to bet on the residuals of its own equipment by writing some nonpayout leases, we have a very strong indicator of a poor residual outlook for that equipment.

The best parallel I can cite is the recent experience with another mainframe manufacturer after it sold off most of its base to end users and leasing companies and subsequently announced changes in its support policies for second users of its equipment. The market for that manufacturer's equipment is very low and I am aware of one buyer of a brand new generation who is unable to sell his system for anything approaching 50%, even though the product is only a year old.

For comparison, recent sales of three-year-old 158s have been well over 80% and a 168 was just sold for well over 85%. These are "wholesale" prices paid by dealers to the first user.

In my judgment, any user who buys a non-IBM CPU is taking serious risks if he does not get some commitments from the vendor contractually giving him some of the "equal treatment" that IBM affords by policy to the users of its equipment.

While this admonition is of lesser importance with an established mainframer such as Burroughs or Univac, it is critically needed for a new manufacturer, such as we are discussing. This subject requires more detail than I can go into in this article, but it is vital nonetheless.

While it is possible IBM also could

(Continued on Page 14)

DP Forms Meaningless Unless Understood by Users

The computer-produced form with a disclosure statement given to Dorothy Allen in 1974 was designed to fit into the national computer system used by Beneficial Finance Co. of Gary, Ind. Because of this constraint, the form was apparently not "in meaningful sequence" — which is a long way of saying it was hard to follow.

The Taylor Report

By Alan Taylor, CDP

Beneficial recently argued before the Seventh Circuit Court of Appeals that the requirement for complying with rules and regulations of the national Beneficial Finance system should protect Beneficial of Gary from a $1,000 award under Regulation Z.

The court, however, had other ideas and gave Beneficial a lesson on what should have happened if some factor like a national computer network requirement caused someone to produce inadequate work. It stated further that the "information should have been transferred to a proper disclosure form by hand."

That's the long and short of of many DP complaints. If a computer system can't produce the required result, then a noncomputer should be given the opportunity to produce it; to dare to claim the right to produce improper results is not the answer.

DPers, like other people, have no right to mislabel, misrepresent or confuse others. Using a computer system yields no right to avoid normal standards. The history of avoiding such standards can now be seen in the statute books and, as the harm involved is more widely appreciated, more and more will be seen.

But dealing with the harm involved is only part of the story. The professional question is how do we go about avoiding it in the future. In the October issues of *Computer Law and Tax Report*, Robert Bigelow, editor, commented on the Beneficial case and went on to suggest DP management "must be sure to clear proposed consumer forms with its legal department."

This is OK if all you want to do is prevent DPers from going ahead on their own, but it still gives no basis for deciding whether programmers or lawyers should judge the issue of meaningfulness — an issue which has been addressed here from time to time.

Meaningful to Whom?

The first question is: To whom should the form be meaningful? The man in the street? The legal department? The programmer? Hopefully, by merely asking the question, the answer becomes obvious. It is none of the above.

Clearly, the form has to be checked for meaningfulness by the people to whom it is to be given, under the normal circumstances involved. The simplest way to find out whether it will be meaningful is to give each person a sample form and then a quiz about what it states, noting how long it takes him to work it out.

Anything which is specifically on the form should, in my judgment, be able to be found in less than 30 seconds. Items which are not on the form directly but which can be calculated from it will be expected to take less than two minutes.

These times are not really average ones. The normal requirement is that they are understood by and clear to anyone liable to receive them. Thus, the outer limit, the people who require the most time, has to be examined. And, it goes without saying, an adequate sample will be used.

Another problem that arises is that the form is designed to come out from the computer in many different circumstances — sometimes saying "yes," sometimes saying "no," etc. But a form that is meaningful under one set of circumstances will not be meaningful under another, so the tests then have to be set up to cover each variety of the form or, at least, all the complex ones.

Under What Circumstances?

Another whole variable is the circumstances under which the testing takes place. In the case of some forms, particularly in hospital environments, the situation may be that the recipient is in no condition to concentrate or to comprehend even the most meaningful form, but will simply sign without reading.

This can be tested for by including some fake forms that have outrageous clauses or grossly mistaken mathematics in them. However, for normal business practice I don't think the time has yet arrived for this action to be required by law although, professionally, I would like some of this type for test validation.

The legal people do, of course, come into the decision. They should look over the tests, look over the results and then agree or disagree on putting the form into use or whether to use a different format.

They will need to know about anyone who gets a wrong answer, even temporarily. They will want to know what distracted him from getting the correct answer. So the test should consist of both asking the people to find out what the form says and to explain where they got the answers. The test supervisor should check and find any incorrect answers and interview all such cases.

Lawyers will also want to know the tests they see are not the successful ones selected out of a larger sample on some selective basis. The test forms and questionnaires should, therefore, be numbered and controlled and the interpretations of the results should account for any spoilage as an integral part of the interpretation.

Frequency of Tests

The final part of the operation will probably be to repeat the tests every so often and, particularly, when the forms are to be used in a new environment, i.e., a Spanish-speaking neighborhood, or after the success of a promotional effort, i.e., bringing in blue-collar clients for a previously white-collar service.

Anything like this will invalidate the prior tests and both DPers and lawyers should make sure the tests are rerun successfully.

So, there are the points to be taken into account. Testing is the best way; watching complaints coming in to your own establishment is the second best. Just leaving it to programmers and in-house lawyers without giving them material to work with is simply asking for trouble. Don't do it.

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Going With IBM May Be Cheapest Short-Term Route

(Continued from Page 13)

change its subsequent user policy and damage the IBM residuals, for several significant reasons IBM can be expected to continue its unique and well understood second user policy.

In order to do a more valid comparison of the systems' costs the ITC must be properly factored in along with the user's effective tax rate, his cost of capital and the effect of accelerated depreciation on his net cash costs after taxes.

As a useful guide, I believe the IBM Purchase vs. Lease Analysis Program is sufficiently comprehensive for virtually any user and yields a valid comparison. IBM will run this analysis without charge; although it is obviously another IBM sales tool, it is objective and reliable.

IBM is unwilling to estimate the residual values which must be supplied by the user prior to IBM's running the analysis. This is where dealers and leasing companies can provide some valuable input to the user.

In the case of a user who prefers to lease his system without retaining the ITC, the IBM 370 becomes more cost-effective. For example, it is still possible to obtain a seven-year true lease on a 370, which has important balance sheet implications for most users. Whether a seven-year lease on non-IBM computers would be similarly treated by most auditors is questionable.

With the ITC going to the lessor, recent deals on 370s have seen rates below 59% of IBM's MAC. If terminated at the end of five years, the anticipated maximum penalty discounts back to an effective monthly rental of only 66% of MAC. If the user should keep the equipment six years, there is no significant penalty exposure.

Since a user can also obtain memory for a 158 or 168 from several non-IBM sources for only 50% of IBM's price, he has the power to lower his costs and exposure, especially in being able to economically expand in the future.

Although it is substantially lower than IBM percentages, a market is also developing for used independent memories from the more substantial vendors (but even here my caution on obtaining contractual remarketing assurances is in order).

There are obviously other factors of a nonfinancial nature to be considered in any comparison of IBM vs. non-IBM. As a result of recent failures in the industry of several firms, the stability of the vendor should be particularly evaluated by the prospective user of non-IBM mainframes (not an easy job because of the previous unreliability of accounting standards).

It may still prove advantageous to install the non-IBM equipment in certain cases. But if the user has properly considered the economic factors he will have made his choice based on a truer picture of the real financial benefits and risks. Thereby, he will reduce the prospects of having set up his firm and himself for a major embarrassment in the future.

Conoie is president of Westwood Leasing Corp., a lessor of IBM equipment located in New Rochelle, N.Y.

Letters to The Editor

Objections to CDP Exam

I am writing with regard to the advice in the Oct. 11 Taylor Report on how to answer two questions taken from the *CDP Guide and 1977 Announcement.* I have more than a problem with these questions and the "correct answers" – I have a fundamental objection to the implied reasoning used in obtaining the answers.

In the first place, while the rationale in selecting answer 2 to question 18 may be acceptable if one is dealing with an entry level coder (although it certainly is not in our business), by no measure does it provide the "best estimate of the largest number . . ." Clearly, a judgment is called for rather than blind arithmetic.

Secondly, since question I is written so no single-listed answer is always correct and, by Taylor's admission, most microprograms are stored in read-only memory (ROM), no case can be made for any other answer that is stronger than the case for answer 3.

K.J. Sroub

Cleveland, Ohio

Exaggerated Obituary

Mark Twain once said the reports of his death were greatly exaggerated. A similar statement applies to the PL/I Language Specification manual. The Data Past of Sept. 8 repeated a false allegation from *Computerworld's* Sept. 4, 1968 issue: The manual no longer exists.

The corpse, however, seems not to have been informed and the current bibliography showed it has gone through three editions since its demise. And since the order number is GY33-6003, it is presumably available for free.

While I can understand how it is possible to be confused when an order number changes, no responsible newspaper would publish such a claim without asking IBM for comment. I, for one, had no difficulty ascertaining the new number and obtaining the new edition.

Seymour J. Metz

Arlington, Va.

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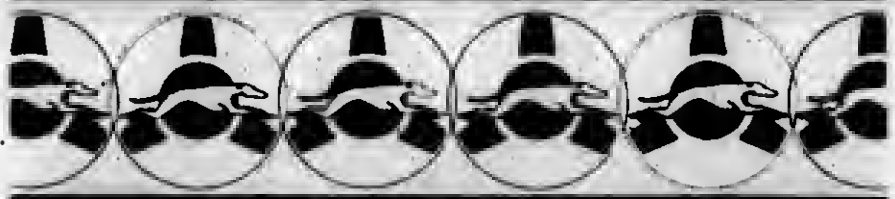

WHEN LEASING COMPUTER EQUIPMENT

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Hardware/DBMS Mix Supports Insurance Group

DES MOINES, Iowa – "We're confident our system will be a major factor in making all our operations more efficient and simultaneously upgrade the quality of our services," Howard E. Clendenen, president of the Statesman Group, Inc., a multiline insurance concern, said recently.

This year the property and casualty insurance industry is "bottoming out" after the worst year in the industry's 225-year history, he noted. "Because of this, we're carefully reviewing all of our operations to find where savings can be made without a negative effect on operations.

"That's where our computer network can be a big help. We feel we've got a system now that will allow us to expand in an orderly fashion rather than on a patchwork quilt basis.

"Working as we do with independent agents who may be representing a number of insurance companies, it's essential we provide the best possible service to induce them to direct their business to us. At the same time, we want to do this without incurring excessive expense," he said.

Statesman is listed among the top 100 companies accounting for about 85% of the total property/casualty/life insurance premium volume in the U.S. Net premiums written by all group companies and affiliates exceeded $100 million in 1974 and 1975. The group is licensed in 43 states and has assets exceeding $166 million.

The company's computer complex is built around two Univac 90/60s. One of the systems, in Statesman's headquarters here, serves the western U.S. The other, in the Indianapolis, Ind., offices, serves the group's business in the eastern half of the nation.

Replacing Univac 9400s, the 512K 90/60s were installed in February 1975. Terminals here include five Uniscope 100 CRTs and three Univac 1900 Computer-Assisted Data Entry (Cade) units.

Plans call for Uniscope 200 display terminals to be placed in the claims, underwriting and accounting departments.

The system here is connected to an IBM 2780 at American Life and Casualty Insurance Co. in Fargo, N.D., an IBM 2780 with Vulcan Life and Casualty Insurance Co. in Birmingham, Ala., and a Uniscope 100 at the Empire Insurance Co. in Santa Ana, Calif.

The Indianapolis 90/60 also has links to the IBM 2780 terminal in Birmingham.

Present applications are processing automobile, fire, casualty and life insurance policies, premium and agency accounting, claims and reserves accounting and preparation of statistics.

Aid to Efficiency

The data base management system (DBMS) now being installed – DMS/90 from Univac – will play a large role in assisting Statesman's directive to practice utmost efficiency in all operations, according to Don Sheil, the DP director.

"Two immediate benefits will be faster claims processing and more efficient processing of policy information," Sheil said.

"DMS/90 will eliminate file duplication. It will maximize efficiency and provide much faster service to our agents and insureds. Most policy and claim information will be processed within a 24- to 48-hour period. We will have an on-line data entry capability to update our files and service inquiries," he added.

The DMS/90 system design incorporated recommendations of the Codasyl Data Base Task Group, and was a major factor in the choice of this particular DBMS, Sheil indicated. In addition, he noted, DMS/90 appeared "to be the path with the least change involved.

"We are building into the data base a flexibility to allow our member companies to retain their individual identities. We've grown very fast over the past 14 years to the point that we now consist of 29 member and affiliated companies, but we believe it's important that control of each individual company continue to reside with its own management.

"DMS/90 can break down the information any way we want it. We can obtain the data in any manner or sequence. Previously we had to access several different files to get what we needed," he recalled.

"Our aim is to provide a company with an information system responsive to the needs of the user departments at the home office, at member and affiliated companies and at agents' offices," he said.

The data base will consist primarily of policy information, customer names, addresses and details of their policies. It will also contain information on the 3,000 independent agents representing Statesman.

Noting DMS/90 is being implemented in well-planned stages, Sheil explained the first operational application planned is private passenger automobile insurance. This is expected to be on-line this winter.

Other applications will be added gradually with the expectation that all of the information will be in the data base by the end of 1977.

Operating System Switch

The company started with the original OS/4 operating system when the 90/60 superseded the 9400, Sheil noted.

"After Univac introduced the Virtual System/9 [VS/9], we started conversion to this operating system with its more efficient utilization memory.

"One of our member companies, Empire Insurance, is now running completely on VS/9 and we have made considerable progress in converting our other operations," he said.

New policies written are mailed into Des Moines by the agents. After checking by underwriters, the information is entered into the system using the Cade and Uniscope 100 terminals. Previously the information was keypunched.

With the terminals, Sheil said, the extensive coding needed with keypunching is eliminated and data input is at least twice as fast, improving policy turnaround and allowing the company to speed up billing.

"If we need to check policies on file or obtain a history of policyholders, we can call up the information on the CRTs within a few seconds. This eliminates the older method of having to manually pull files from among the 600,000 policies kept in paper files. It will also allow clerical personnel to be assigned to more important tasks," Sheil said.

In addition to the on-line policy work, the computer also prepares a series of monthly management reports outlining underwriting and loss activity as well as expense distribution.

Data 100 Enhances Keybatch Software

MINNEAPOLIS – An update of the Keybatch software now available from Data 100 Corp. enables users of the company's recently enlarged Keybatch keystations to work with a variety of capabilities for the first time, a product bulletin indicated.

Among the features included in Version 3, Release 1 of the software are support for "in-line" tables to speed data validation, Indexed Sequential Table Retrieval (ISTR) capability comparable to Isam capabilities in other systems and two forms of line-level table and program updating expected to be useful in central support of dispersed keystations, Data 100 said.

Features available in earlier releases have been extended. The number of local keystations, for example, has been increased to a maximum of 16, including eight running concurrently, a spokesman noted.

The system will support three remote stations, rather than two as previously, and emulators for various communications environments can be used concurrently, he added.

The ability to have lookup tables directly in-line with the user's program code is important, the company said, because it eliminates the need to keep track of where the table is and how far through the table a search has gone.

Both of these chores can distract a programmer from the main purpose of the application coding, the spokesman explained.

Other added features are said to include queued data displays, expanded use of arithmetic and logical operators, right- and left-shift accumulator operators and better support for both magnetic tape and disk.

Version 3 Release 1 requires an FML-11 processor with 65K bytes of memory. The FML-11 is a newly released configuration of the company's Model 74/78 Keybatch hardware, the spokesman added.

While there is no cost for the basic Keybatch software package, there are "minimal" costs for some of the features, including concurrent data entry and some of the communications emulators, he said from 5701 County Road 18, Minnetonka, Minn. 55343.

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Study Documents Comparative Network Use Costs

STAMFORD, Conn. – *A Comparative Remote Batch Cost Analysis Report*, recently published by Real Decisions Corp. (RDC) documents the costs of running a set of standardized programs on various commercial networks.

Beyond that, however, RDC has said it will run the same programs utilized in the report on systems belonging to purchasers of the report at no extra charge.

In that way, users can see how their own environments compare with those provided by the network vendors, RDC said.

The primary purpose of the report was to compare effective costs of operation and pricing structures on several major vendors of remote batch services. RDC designed a series of runs to utilize comparable resources – to the extent possible – on Control Data Corp., IBM and Univac equipment, the research firm said.

The bulk of the report itself is made up of 27 graphs showing how specific runs fared on the different networks and on different pricing choices within each network. There seems no regular pattern of which services are "best" for all runs; instead, the reader is left to pick the network according to the type of work being done.

The basic set of runs included in the report were all written in Fortran, "the most directly comparable language to use on a variety of services," a spokesman explained.

Five runs were classified as CPU-intensive; requiring increasing amounts of core storage and computation. Six runs constituted the I/O-intensive series and utilize minimal computation and a standard amount of memory, RDC said.

RDC modified and mixed the runs to find the cost of different job streams, the report added.

RDC contracted with the vendors for use of the resources but, as the report noted, RDC controlled the operation and monitored the results of all runs and all combinations of runs.

The 97-page report costs $1,995 and is available from RDC at 870 High Ridge Road, Stamford, Conn. 06905.

Airline Information Now on APL Services

RICHMOND, Va. – An airlines origin-destination data base now available from the APL Services Division of The Computer Co., Airmarket is said to be based on statistics collected quarterly by the Civil Aeronautics Board.

The data base can be used to derive revenue passenger miles, total passengers ticketed and each certified carrier's market share and market ranking for each quarter year since 1972 by mileage and city codes, according to a division spokeswoman.

Facilities available with Airmarket permit the user to create unique data bases, perhaps combining some of the given data with other material collected from other sources, she said. A report generator is also part of the Airmarket "package," she added.

The data base itself gives total airlines statistics for more than 68,000 domestic city pairs and detailed carrier information for more than 26,000 city pairs.

The data is available in both on-line time-sharing mode and remote job entry batch operations with results returned to high-speed printers at the user's site or at The Computer Co.'s offices, the firm noted from 1905 Westmoreland St., Richmond, Va. 23230.

No Need to Know DBMS on Nets

MINNEAPOLIS – People who work with data base management systems (DBMS) installed on commercial remote computing networks apparently do not need to know the inner workings of the systems as much as do people who work with DBMS installed on in-house configurations.

That at least is the impression left after reading *A Study of the Use and Availability of Data Base Management Systems* in remote computing services in the U.S., recently compiled by Info-Dyne, Inc., a research organization based bere.

Only nine of the 59 users of "remote" DBMS who responded to Info-Dyne's queries claimed to know their DBMS "inside and out" – even when the systems involved were familiar ones.

The same lack of concern was highlighted in Info-Dyne's summary of trends when the report noted "from a practical, technical standpoint, there is very little difference between Nomad, System 2000 and Oliver, for example . . . Otherwise equivalent vendors, each with one of these systems, would seem to most prospective users to be virtually identical.

"In the minds of the users, the major areas of differences between (the available) DBMS are not in the features area but rather in other areas like quality of support, documentation and vendor staff and price," the report said.

Info-Dyne is at Suite 196, 4600 W. 77th St., Minneapolis, Minn.

UCC Installs Enhanced Exec 8

DALLAS – Remote batch computing services based on Univac 1108 running under OS/1100 (the current version of what used to be called Exec 8) are now available from University Computing Co. (UCC).

The service provides a multiprogramming environment suitable for program development and production processing of both business and engineering applications, UCC said. There are, for example, the two Fortran and two Cobol compilers that are standard with OS/1100, a spokesman noted.

One of the Cobol compilers is "very IBM-compatible," he added, suggesting perhaps one group of users the company expects to support.

For engineers, application systems presently on the service include the Integrated Civil Engineering System (Ices) and the Functional Mathematical Programming System (FMPS). Ices includes the structural design package Strudl-II; FMPS is a linear programming application for operations research projects, UCC said.

UCC's network is accessible and users are supported from more than 30 offices throughout North America and Europe, the spokesman added.

The company's Scientific and Engineering Division can be reached through P.O. Box 6171, Dallas, Texas 75222.

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'Etos' Enhanced for PDP-8s

HARTFORD, Conn. – An installation with a Digital Equipment Corp. PDP-8 can support simultaneous timesharing, real-time tasks and batch operations even though each operation is running under a DEC-supplied single-user environment with the Educomp Timeshared Operating System (Etos), according to its vendor, Educomp Corp.

Etos, like IBM's Virtual Machine (VM/370) facility, permits concurrent users to work as if the system were completely theirs, including as much as 32K words of "virtual" memory.

Each may work with a different operating system or several may use different parts of the same system at the same time, Educomp said.

In addition to broadening access to various DEC operating systems, Etos also provides extended programming support under OS/8. Languages under Etos include a "solid" Fortran IV, Assemblers, Educomp's Extended Basic and Cobol/8.

Printer spooling and card reader spooling have been added to Version 4B of the system, which was released recently. Support for detaching programs is said to have been improved and commands simplified.

Partial job accounting is a feature of this version and file structures under Etos are said to be more sophisticated than before.

The Etos software requires an omnibus PDP-8 modified by the insertion of Educomp's TSC8-75 time-share control printed circuit board.

The TSC8-75 and software are available as a package for $4,900, the spokesman added from 196 Trumbull St., Hartford, Conn. 06103.

'Inquire' Gets Search Feature

FALLS CHURCH, Va. – Proximity searching, an option added to the Inquire data management system from Infodata Systems, Inc., is said to ease the searching of large textual data bases to locate text or documents containing specific words, according to an Infodata spokesman.

With the Inquire command language and the proximity searching option, users can locate documents which contain one or more words within the same field or sentence, within a specified number of words or sentences of each other and in a specified order, he said.

The contents of both text fields and other fixed or variable fields, as well as optionally assigned index terms, can be searched by the same command. Once the desired documents have been located, the user can control formatting and printing, the spokesman added.

The proximity searching feature operates on existing Inquire data bases without reorganization. New documents can be added to the data base and old documents modified, the company said.

Inquire,, including the search option, operates on IBM 360/370 CPUs under OS, OS/VS1 or VS2. It requires a minimum of 130K for the command language processor and costs $16,500 to $76,500, depending on options selected.

Infodata is at 5205 Leesburg Pike, Falls Church, Va. 22041.

Sectioning Array 'Not New'

By Richard C. Rockwell

Special to Computerworld

Bruce Weinstein's "Sectioning Base Array Voids Fortran Size Problems" [CW, Sept. 27] described a method of dynamic allocation of arrays long used by application programmers in writing statistical packages, particularly for the social sciences.

For example, the Data-Text project at Harvard University used this technique in the mid-1960s, and Earl Jennings used it in a statistical package at The University of Texas at Austin, perhaps somewhat earlier.

I strongly suspect it is used in both the Osiris and BMD packages; IBM's Scientific Subroutines Package also allows its use.

Weinstein missed one of the side benefits of this method of array allocation: the ability to define arrays of four or more dimensions. An arithmetic statement function may be used to determine the appropriate location in the single-dimensioned array for an element with subscripts i, j, k, . . . m.

In addition, this facility may be used in conjunction with an algorithm to permit dynamic determination of the number of DOs to be executed in a program – not just of the number of iterations of each DO. As most Fortrans restrict the level of nesting of DOs, this facility has limited but important use.

Rockwell is a Visiting Fellow at the Boys Town Center for the Study of Youth Development, Omaha, Neb.

Package Called Diagnostic Tool For 'Most' Abended Programs...

CLEVELAND – The Abend-Aid package from Neoterics, Inc. was designed to provide computer-assisted analyses of abnormal program terminations (Abends) to programmers working in IBM OS or VS environments, Neoterics said.

The package diagnoses "nearly all" Abends, providing the user with information on what occurred, where to look in manuals for additional information and specific details required to correct the problem, according to the company.

Abend-Aid output is limited to a single-page report on each termination, with the corrective information in "English-like text." By eliminating lengthy core dumps, this output reduces computer time, disk queuing and paper consumption as well as programmer time, a spokesman added.

More than 160 unique Abends are diagnosed, including Program Exceptions, Data Exceptions and "almost all current Access Method file problems (including Vsam)," he said.

Each supported system Completion Code has its own user-supplied "what-to-do" option which can be overridden on a program-by-program basis, he added.

The modules needed to service an Abend are brought into memory dynamically once the type of problem has been diagnosed. In that way, the memory required by Abend-Aid is kept to a minimum, Neoterics said.

No changes are needed in the logic of Assembler, Cobol or Fortran programs to utilize Abend-Aid, nor is any modification required in the IBM-supplied code for OS/MFT, OS/MVT, OS/VS1 or OS/VS2 (SVS), the firm added.

Since the interface routine can be dynamically loaded, overhead for the Neoterics system is approximately 800 bytes. Memory used by the diagnostic modules is returned to the system before further processing occurs, the spokesman explained.

The basic Abend-Aid package costs $2,975 or $175/mo. Separately priced modules – covering Cobol dynamic load, for example, or Cobol segmentation – range from $150 to $950 or $10/mo to $60/mo extra, he said from 330 Investment Plaza, Cleveland, Ohio 44114.

...Giveaway Shows Existing Problems

CLEVELAND – A free package that may help users determine if their installations could effectively utilize an analysis tool such as the Abend-Aid package (see story above) is available from Neoterics, Inc.

The SMF Abend Analysis (AbaidSMF) program will read a data set containing the user's SMF data and produce a report showing the number and type of Abends that took place during the SMF reporting period, Neoterics said.

Other data produced includes the number of lines and pages printed in Abend-generated memory dumps and the time it took to print those dumps.

The report also shows how many of the Abends would have been handled by Abend-Aid and how much printing time and supplies would have been saved, a spokesman added.

Neoterics is at 330 Investment Plaza, Cleveland, Ohio 44114.

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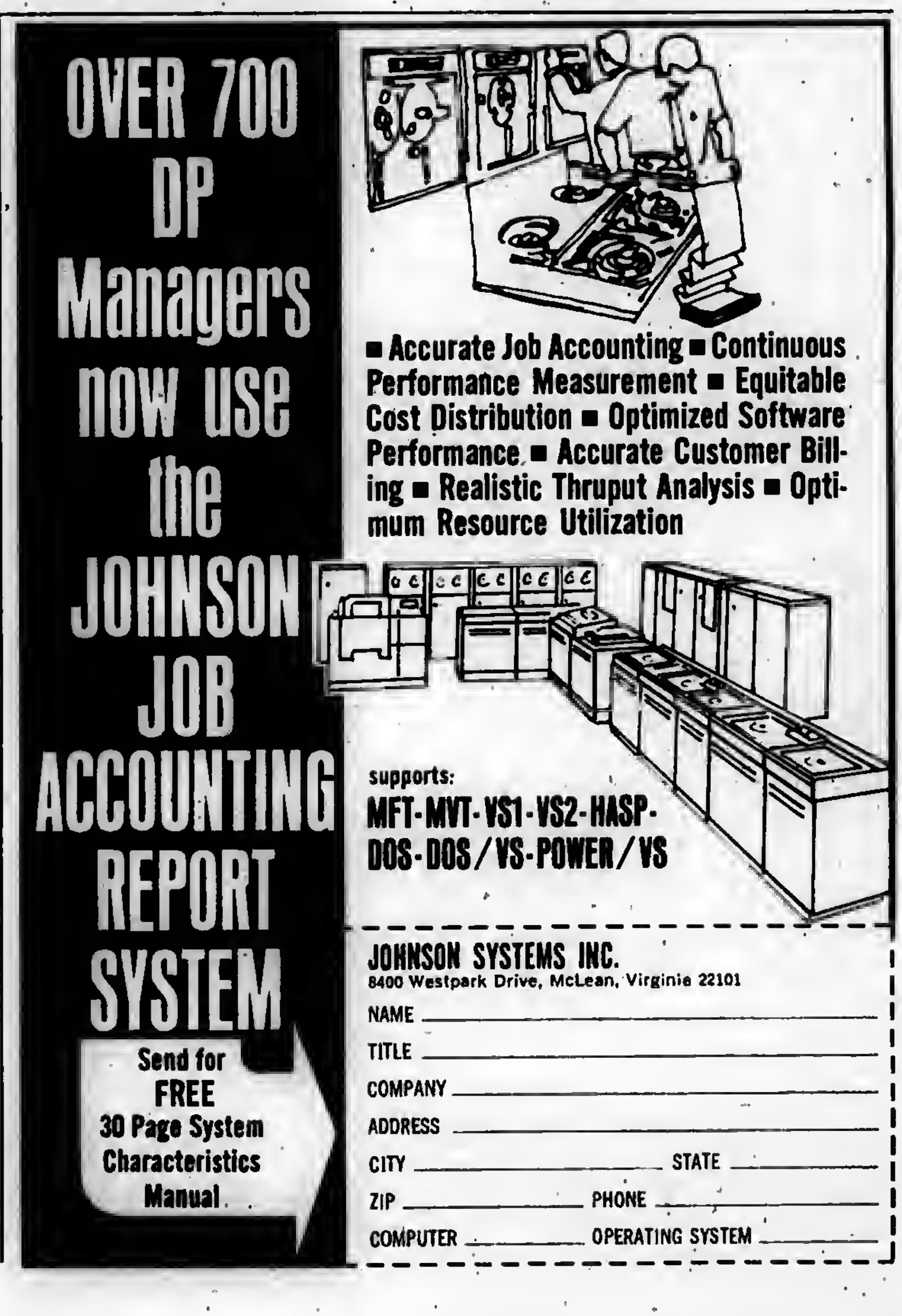
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Despite Flawed Systems, This User Still Has Hope

By Jack Stone

Special to Computerworld

We in the computer community sometimes discount negative reactions from end users more than we should. That's why I was so shaken by a conversation I had with Nora C. Manning, a recently retired former owner of an insurance agency in the Midwest.

As you can see from the following transcript, Manning is a long-time end user of systems implemented by the companies she represented. Almost incredibly, she is still hopeful of future benefits, even though the systems slowed some of the services she provided and apparently caused dollars-and-cents damage to her business.

Read on, then – please – make sure the end users of systems you're managing can't say the same about their experiences.

Q: How long were you in business?

A: For 43 years. I was the sole owner of my agency since 1957, when my husband passed on, and transferred the business to my oldest son when I retired this year.

Q: Would you briefly describe your business operations?

A: Our agency provides the full line of fire and casualty insurance services for personal and commercial accounts. We represent the lines of 10 different insurance companies.

The Human Connection

About 65% of our business was obtained from commercial accounts. When I retired, the agency had about a thousand active accounts, primarily in Kansas, handled by four full-time employees.

Q: I assume your paper-handling workload was substantial.

A: Oh, yes! And, as you can appreciate, the policies, their endorsements and billings must be accurate and timely to give the customers the assurance they are properly protected.

Q: Could you describe how you handled the work in the old days? How effective were your procedures then?

A: Oh, we had wonderful procedures! They were very important in helping us give the good service our customers have come to expect.

Each company supplied us with blank forms. We were usually able to issue policy and endorsement requests the same day we received the orders and send the material out to the customer, along with an invoice, within a day or two.

You see, in those days, the agent had complete responsibility for selecting the coverage and figuring the premium. Naturally, we sent copies of the policy and its endorsements to the insurance company, which maintained central files for establishing premium rates, paying agency commissions and, of course, auditing our premium calculations.

Q: Didn't manual preparation of all those policies, their endorsements and the premium calculations – which perhaps numbered in the thousands last year – lead to many errors in policy coverage?

A: Well, not really, no. You see, my son and I handled all the figuring, and we checked and double-checked premium calculations and other policy data. We very rarely made a mistake of consequence.

Also, we were fortunate in building a loyal group of policyholders by providing them correct and timely policies over many years; an occasional error did not concern them if we contacted them promptly and gave them a proper explanation.

In addition, the company auditor would report to me within a week or two if he found an error.

I don't recollect ever losing a policyholder because we didn't figure the premium correctly the first time.

Q: How and when did computer automation come to your business?

A: Well now, we didn't have a computer in our office. Our insurance companies started their own systems one-by-one from 1968 to 1970. These actions caused substantial changes in the way we handled our insurance forms.

For most insurance plans, for example, the company computer took over the responsibility for calculating premiums and actually preparing policies and their endorsements. We supplied the basic information using an "application" form for issuance of the policy and a "policy change request" form for endorsements during the policy term.

Although the companies offered to send the material directly to the customers, we preferred to have the policies mailed to us for auditing before sending them on to the customers. Also, the companies would automatically send us renewal policies when they were needed.

Q: Now that computers have been working for your former agency for nearly 10 years, what's your evaluation? Did they expand your business, improve customer service or reduce workload and expenses? Did they increase profitability?

A: Our agency people certainly like the computer-prepared renewal notices. This is a real service!

On the other hand, the computer is very slow in handling our policy change requests. We often wait from two weeks to three months before receiving confirmation of changes, whereas we were always able to provide such notice in a matter of a day or two before the computers came.

Furthermore, since we have to check everything the computer sends us (we have caught numerous errors over the years, although it is getting better), our paperwork has substantially increased.

The computers, overall, have probably cost us some profits, not in terms of loss of customer billings, but because our commissions have been cut in recent years, in part because of the heavy expenses involved in bringing these machines into the industry.

I feel that there is a marvelous future for computers in our industry. Much has been accomplished in the last decade, and I believe that with all those bright young computer men and women, our industry should find the computers to be highly profitable in the next decade.

Letters outlining questions, issues or situations pertinent to human relations in the DP setting may be addressed to Stone c/o Computer Education International, Inc., Suite 222, 2233 Wisconsin Ave. N.W., Washington, D.C. 20007.

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- **12** VP/Assistant VP
- **13** Treasurer/Controller/Finance Officer
- **21** Director/Manager of Operation/Planning/Administrative Service
- **22** Director/Manager/Supervisor DP
- **23** Systems Manager/Systems Analyst
- **31** Manager/Supervisor Programming
- **32** Programmer/Methods Analyst
- **41** Application Engineer
- **42** Other Engineering
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New Technology Forcing Changes In DP Manager Role, AIIE Told

By Don Leavitt
Of the CW Staff

SAN FRANCISCO – Over the next 10 years, data base and on-line systems will change the role of the DP manager "dramatically," according to the president of National CSS, Inc.

The Human Connection

On-line processing gives the non-DP manager immediate access to information, but since the coding for this type of operation is "usually not done by programmers, [it] makes more demands on a computer system to be bug-free, reliable and easy to use," Robert E. Weissman said.

Data base systems generally are capable of supporting different users who have "distinctly different" information needs and who want to have access to their information simultaneously, he added in keynoting a recent American Institute of Industrial Engineers (AIIE) seminar.

Instead of limiting his job to effective management of the corporation's central computer installation, the successful manager of the next decade "will see his responsibility more and more as helping each profit-center manager in the corporation to get the right information at the right time," he said.

Large centralized operations, which seemed natural as they developed in the 1960s, are now being challenged by many things, he noted later, adding "the most powerful agent undermining the sovereignty" of the centralized facility is "the structure of American business itself."

Large corporations are decentralized, "divisionalized" and profit-center oriented, Weissman said.

More and more non-DP profit-center managers "are demanding, have the budgets for and are willing to pay for the delivery of specific answers" to specific business problems. Computers have been "demystified" to a large degree and "[non-DP] managers are comfortable using computers under their control."

The tools for developing a "rational structure" in DP along the lines of the structure of American business "with localized DP operations and customized on-line data base capabilities" are available, he added.

Intelligent terminals capable of working with a corporation's central CPU, standalone minicomputers and commercially available remote computing facilities and networks are among those current tools, Weissman noted.

Despite the possibilities raised by these approaches, however, there is resistance to the change from centralized to dispersed DP operations, he told the engineers. The kind of changes he was describing "are at best a disruption to current day-to-day activities and at worst represent a dire threat to the status quo" in thousands of centralized organizations that exist today.

Since "for the most part they are sound and stable and perform a useful service, the resistance of these centers and their managers to what is only a potentially more efficient distributed DP environment" is quite natural, Weissman said.

The organization that successfully "navigates the turbulent waters" between the factors forcing a change toward a more decentralized system of DP and the still present need for certain centralized functions will have to recognize those factors and make sound organizational decisions, he said.

In designing a DP environment that makes sense for the needs of a particular company, numerous detailed questions have to be answered, he said, providing a dozen or more as examples.

More broadly, he urged the members of his audience to ask themselves, " 'How can an environment be created that fosters constructive change to take advantage of a changing technology?' "

Cincom's 'Knock-About' Planned for Next Week

CINCINNATI – This year's "Knock-About," a conference for users of Cincom Systems, Inc. products, will be held Nov. 7-10 at Stouffer's Cincinnati Inn here.

Open to anyone within using organizations, the meeting has a registration fee of $145, the company said from 2300 Montana Ave., Cincinnati, Ohio 45211.

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Phone System Called 'Neural Network'

Reform Act Seen Assuring Bell's 'Systemic Integrity'

By Ronald A. Frank
Of the CW Staff

WALTHAM, Mass. – The real issue raised by the Consumer Communications Reform Act of 1976 concerns the "systemic integrity" of the Bell System network, Ted Simis, an assistant vice-president in AT&T's Computer Communications and Data Services Division, told a recent meeting here of the New England Telecommunications Association (Neta).

The telephone system has become a "neural network" with nerve endings that reach into computers, Simis explained. The pieces of the network are all interdependent; before there can be competition for certain segments, each of the pieces must first be made separate cost centers, he said..

Profits Not at Issue

AT&T profits were not an issue in the introduction of the Reform Act, Simis added. "We need a sense of direction. We have got to know the rules so we can live in a competitive environment," he said, adding that is the reason the legislation was presented to Congress.

Simis said the supply of terminal equipment is "not a natural monopoly" and indicated there might be room for competition in this area under some well-defined specifications.

These specifications could be encompassed in the equipment registration program set up by the Federal Communications Commission (FCC), but changes would have to be made since the program is now "weak in performance after design," he said.

The nationwide phone network should ultimately support multifaceted terminals for the business user; systemic innovation, however, should not be discarded in favor of product innovation which would only provide business users with a "short-term advantage in rates," he warned.

Users should present their opinions on this issue, he added.

Marketplace Preemption

Taking issue with Simis was William McGowan, board chairman of MCI Communications Corp., who described the Reform Act as "providing the opportunity for Congress to determine our professional futures instead of allowing the marketplace to do it."

If the bill passes, "we will all be out on the street," McGowan told Neta members.

Under provisions of the Reform Act, Bell would be able to give away services until all competition was eliminated; rates would then rise again, he said.

In addition, the Bell-fostered legislation would hand over regulatory control now vested in the FCC to 50 state regulatory commissions. This would preclude the FCC from ever again allowing competition, he said.

When he first saw the legislation early this year, McGowan assumed no member of Congress would "touch this bill," he said. Now that 40% of Congress has backed it, it is "one hell of a problem."

As long as the legislation is pending, the Bell System will have an advantage over its competitors, he said.

In the final analysis, Congress is very sensitive to constituent input; for this reason, users should do everything possible to transmit their views to their elected representatives, he said.

The entire thrust of recent FCC policy favoring competition has been to give the consumer a choice and to force innovation in an industry where the established carriers have been very slow to introduce new offerings, McGowan said. If users want this to continue, they will have to speak out, he added.

Policy Changes Spawning Services

Communications Industry Now in Transition: Doll

NEW YORK – The communications industry is presently "undergoing a major transition" in the form of new types of data communications services which will affect users in the future, according to Dr. Dixon R. Doll, president of DMW Telecommunications Corp.

The introduction of new communications services has been "spawned by significant regulatory policy changes [that] are enabling many services firms to provide and utilize intelligent data communications networks for multiple purposes," Doll told financial analysts at a meeting here recently.

The advent of intelligent networks, Doll said, contrasts with the computer services industry's traditional use of data communications "merely as a vehicle enabling customers to access processing power, data base and application program resources.

"In addition to traditional computer service activities, firms may also resell excessive network capacity to customers through regulated common-carrier subsidiaries.

"For the last few years," Doll stated, "Tymshare Corp. has offset its network expenses by several million dollars through a provision in the tariffs enabling joint usage of standard voice-grade lines."

Doll was quick to add, however, that other companies have been reluctant to exploit similar tariff provisions.

This reluctance primarily stems from "an historically unclear situation with respect to the tariffs and the legalities allowing customers to utilize computer services networks to obtain plain communications," he said.

"Value-added common carriage has also become a unique factor in expanding the historical marketplace for computer services firms, both at the regional and at national levels," Doll noted.

"Value-added carriers such as Telenet Communications Corp. and Tymnet Communications have filed [with the Federal Communications Commission (FCC)] to establish networks which involve the resale of raw communications capacity procured from the Bell System and other licensed common carriers owning intercity lines," he stated.

"These intelligent networks are enabling regional computer services firms to instantaneously obtain access to national distribution vehicles without the major expenditures and time delays in designing, constructing and operating their own private network facilities," he explained.

Clouded Future

Doll said the future is clouded with respect to the ultimate position of value-added common carriers.

"With the reopening of the Computer Inquiry by the FCC, it appears the Bell System will be prevented from offering DP services per se.

"However, there are many unclear areas such as the regulatory situation with respect to Bell System data terminal equip-

(Continued on Page 24)

Bus Provides Unusual Site for Unusual Application

By John P. Hebert
Of the CW Staff

GLEN ALLEN, Va. – A traveling schoolroom is providing an unusual setting for interactive computer terminals in what is believed to be a unique application of full-duplex modems transmitting to a single telephone line.

The Mathmobile journeys to three different elementary schools serving the city of Richmond and the Virginia counties of Henrico, Goochland and Chesterfield to provide computer-assisted mathematics instruction, according to Dr. Wesley Batten, director of the Mathmobile program.

It is equipped with eight General Electric (GE) Terminet 30 teleprinters and one Vadic Corp. VA3405C modem which allow on-line interaction with the Mathematics and Science Center, a consortium of four public school divisions here, Batten said.

The center houses a Hewlett-Packard (HP) 2000E CPU with two disk drives and 32-port simultaneous operational capability. The CPU was upgraded to make it, in effect, an HP 2000F, Batten said.

The Mathmobile: Eight terminals, one modem and a single telephone line . . .

"Nobody had ever used eight terminals to transmit information on-line down a single dial-up phone line," he added.

"We were told 'You just can't do it that way,' " he recalled, "and all we need is somebody to say we can't do it and we will do it."

Vadic, piecing the application together, found one high-speed VA 3405C modem with "zero turnaround time" placed in the Mathmobile and one placed in front of a Timeplex T-16 multiplexer at the math and science center would carry the signals down the dial-up line at 1,200 bit/sec, according to Batten.

For a multiplexer to divide an eight-unit data stream, the stream ordinarily has to be split into pairs of four units. With that method, two telephones are required to handle the two groups of four printers, but "we didn't feel like tying up two telephones at each of the schools dedicated for the Mathmobile application," Batten said.

"Nobody wants to have two telephones in their school office tied up," Dr. Shirley

(Continued on Page 22)

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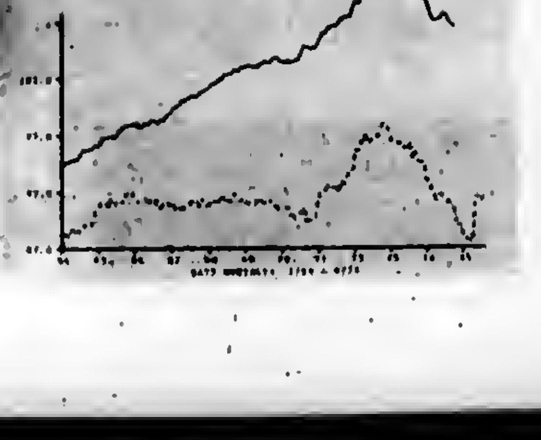

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CSI Multiplexer Works With Minis

MINNEAPOLIS — Custom Systems, Inc.*(CSI) has a multiport communications interface for Data General Corp. and Digital Computer Controls, Inc. minicomputers.

The multiplexer and all necessary control logic are contained on a single printed circuit board available in either four- or eight-channel configurations, according to a CSI spokesman.

A capability allowing a mini to be expanded from a minimum four lines to a maximum 64 lines is included in the unit's control logic; up to eight multiplexer boards can be placed in a CPU, the spokesman added.

Data format and transmission rate are selectable on an individual channel basis through jumper strap options on the circuit board, he said.

Prices for the Interface start at $1,250. CSI is at 2415 Annapolis Lane, Minneapolis, Minn. 55441.

Includes Master, Students Keyboards

Digi-Log Adds Modular Teaching System

HORSHAM, Pa. — The On-Line Classroom from Digi-Log Systems, Inc. was designed to interact with a real-time computer system for teaching, problem solving and text manipulation applications.

The teaching terminal system consists of modular components including an interactive keyboard and 12-in. CRT for the Instructor and auxiliary keyboards for students. The students' keyboards are controlled from the instructor's master terminal, according to a Digi-Log spokesman.

The master terminal operates on-line to an on-site or remote time-sharing computer system at transmission speeds up to 9,600 bit/sec or 300 bit/sec respectively, he said.

The master terminal is a standard Digi-Log Telecomputer terminal with a built-in acoustic coupler. It has video display drivers for information display on 10 to 15 video display monitors placed up to 1,000 feet from the master terminal in the classroom or lecture hall, the spokesman noted.

The students' keyboards are teletypewriter-like and operate on a time-shared basis with the instructor's terminal; only one student keyboard can be active at a time, he explained.

A switch box control module on the instructor's terminal selects which student terminal will be active, he added.

Communications from the On-Line Classroom can be made to any CPU with dial-up capabilities from the Ascii, asynchronous, dial-up master terminal, Digi-Log said.

The system includes RS-232 and current-loop printer interfaces as standard equipment for links to printers with RS-232 communications capability, the spokesman added.

The printer, not offered by Digi-Log, is used to keep a record of transactions with the time-sharing system, he said.

Assuming the large video display monitors already exist in a school, Digi-Log said, the minimum On-Line Classroom configuration is priced at $2,495 plus $550 for each auxiliary keyboard.

Delivery is 45 days from Digi-Log's headquarters at Babylon Road, Horsham, Pa. 19044.

Bus Provides Unusual Setting

(Continued from Page 21)

Lingo added. Lingo is the associate director of the program.

"It would have been a pain to install connections providing for the connection of two telephone lines. Eyebrows would have been raised," Lingo said.

By using the single full-duplex modem, the Mathmobile can roll up to any school and use it with a single telephone, he said.

The Mathmobile travels to the three schools, — 2-1/2-, 10- and 35 miles away from the math center — every day. Forty selected students In the second and third grades receive what Batten called "a 10-minute exposure to the terminal" by interacting with a drill-and-practice math program housed in the center's CPU.

The Mathmobile is equipped with 200-ft extension cables for electrical power and telephone connections to patch into plugs at the three schools. A telephone handset in the mobile unit allows the driver/instructor to dial the center's telephone number and send all eight terminals' signals down the single line to eight different ports in the 200F CPU.

The Mathmobile's traveling teacher works with students and makes sure they are on their proper level of study within what Batten termed "concept blocks" based on HP educational software programs.

The students, he said, were selected by the school division and are excused from their regular classroom routines for the interactive drill and practice.

There has been a tremendously positive reaction to the program, Batten noted, and the students have achieved good test scores and significant gains in mathematics ability over students in the traditional classrooms.

Batten and Lingo initially wanted Teletype Model 33 keyboard send/receive terminals because of their good experience with about 55 terminals within the counties' schools. Teletype, however, was unable to furnish the center with eight terminals in the timeframe constraint the center specified, Batten said.

Center personnel then turned to GE, although Terminets were virtually untried in the field.

Terminals Pushed Hard

"We put those eight terminals to work in a hurry and GE stood behind us very well on the Terminets. We pushed pretty hard. We're a tiny little consumer and [GE] did a darn good job to help out the little guy," Batten remarked.

He also said the center had worked with the Vadic people in the past and "had confidence in Vadic's ability to problem solve." Batten was "equally impressed with the Timeplex people," he said.

The response time from the Mathmobile to the center, however distant, is no more than 3 sec under loaded conditions but usually less than 1 sec, Lingo said.

The math and science center also utilizes Vadic 307C modems at the front of the CPU and Vadic Model 306A modems interfacing the Teletypes in the field with 32 dial-up telephone lines at speeds up to 300 bit/sec.

Olivetti Has Teleprinter In KSR, ASR Versions

NEW YORK — Olivetti Corp. of America has introduced two models of the TE 400 modular electronic teleprinter system — one an automatic send/receive (ASR) version and the other a keyboard send/receive (KSR) model.

The TE 400 was designed for dedicated or switched networks using five-level Baudot code.

The units feature electronic alphanumeric keyboards which are said to automatically control the shift between upper and lower case characters.

The units also feature as standard equipment high access speeds, 64K-character memory buffers, dot matrix impact printers, integrated line control units to manage operating modes and a control console with visual and acoustic signals, according to a spokesman.

The TE 400 will be available in both versions by the first quarter of 1977, he said, adding a stripped-down TE 400 KSR costs $2,381 while the basic ASR model is priced at $3,089.

A variety of options is available for either model, he said from 500 Park Ave., New York, N.Y. 10022.

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Datapoint Introduces Modems, Peripheral Switchers

SAN ANTONIO, Texas – Datapoint Corp. has added two modems and three peripheral switching devices to its product line.

The modems were designed to connect remote user terminals to the Datapoint Datashare business time-sharing system, while the switching devices allow a modem or other peripherals to be shared between two Datapoint processors.

The Model 9408 and Model 9409 modems operate asynchronously over standard dial-up or leased telephone lines; both operate in full-duplex mode, according to a company spokesman.

The main channel of either modem transmits data at 1,200 bit/sec from the Datashare system to a remote terminal's CRT screen; a 150 bit/sec reverse channel carries keyboard-entered data to the system, he said.

The Model 9408 connects to the communications port of the Datashare system, while the 9409 is utilized at the remote terminal, the spokesman noted, adding a Bell-supplied Data Access Arrangement (DAA) is used to connect the modems to the phone lines.

Either model can be leased for $21/mo on a two-year lease or purchased for $790. Metropolitan-area maintenance costs $15/mo with an additional one-time $15 installation charge, according to the company.

Peripheral Switchers

In installations where two Datapoint CPUs are located in close proximity, the Model 9025 peripheral switching device reportedly will connect one peripheral to either of the processors by the activation of a switch.

The Model 9026 switches two peripherals to one processor, the Model 9023 switches a communications adapter or modem between two processors, the spokesman said.

When each processor only occasionally requires the use of a particular device, the switches eliminate the need for recabling between the CPUs, he added.

The models 9025 and 9026 T-bar-type switches allow an I/O device to be switched from one processor to the other or for two peripherals to be switched to the I/O bus of a single processor, he said.

The Model 9023 is said to allow two communications adapters to alternately use a modem or to allow two modems to be alternately accessed by a communications adapter.

The 9023 uses RS-232C wiring and can be utilized with any communications device conforming to that standard, Datapoint said.

Purchase price of the models 9025 and 9026 is $514 each; the Model 9023 switch costs $224, the Datapoint spokesman said from 9725 Datapoint Drive, San Antonio, Texas 78284.

Industry Now in Transition: Doll

(Continued from Page 21)

ment," he said, adding the Bell System traditionally has filed tariffs for the provision of teletypewriters and other widely utilized terminal equipment in the computer services industry.

"Recently, Bell was temporarily prevented by the FCC from offering a CRT display terminal with a microprocessor for interstate applications on the basis the terminal contains the capability for providing DP services.

"In a rare display of harmony, IBM and virtually all of the major suppliers of competitive terminal equipment have joined forces to oppose the Bell System's proposed tariff for offering the CRT terminal, known as the Dataspeed 40.

"Paradoxically, this terminal is already being permitted to operate on interstate networks, but only when it operates in a Teletype emulation mode," he noted.

"Also of major significance is the fact that the same CRT device temporarily banned for interstate communications has been successfully tariffed for intrastate applications in numerous states," he added.

User Dilemma

"One major issue facing users these days is whether to utilize the public, intelligent networks or to construct and operate their own systems. One can easily visualize the evolution of a communications resale industry which effectively provides the retailing function in distributing communications capacity to all users," Doll said.

"An important impact on the computer services industry, however, is the burgeoning impact of intelligent communications networks such as those available from Telenet and Tymnet to allow users and potential customers with different host computer facilities and terminal equipment to freely interconnect with minimal software and hardware conversion requirements."

Doll said the recent availability of such intelligent network services is stimulating the computer services marketplace by bringing together many potential buyers and sellers of application packages and data bases more readily than was possible in the past.

Turning to recent tariff action, he said there have been numerous disturbing trends in local Bell System operating company tariffs that are going to run up the costs for local dial-in services used by service firm customers.

"Throughout the country, the Bell System is implementing a policy of converting to dial network tariffs where even local calls will be tariffed according to their holding times.

"Historically, local call tariffs enabled users to remain connected to the dial network indefinitely since tariffs were structured on a per-call basis rather than on a holding-time-sensitive basis," he explained.

Doll added that his firm has recently seen numerous end-user clients facing increases of 50% to 300% in the cost of local message unit charges, with typical prices for local call connect time ranging from $3 to $5/hour. "This phenomenon will continue to spread around the country," he claimed.

The only way to avoid the increases will be to utilize alternative strategies such as short-distance, leased-line connections or to find ways to share individual communications facilities across a wider variety of user terminals and computers all the way down to the local distribution level, according to Doll.

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Purchase Decision Lets Hospital Cut Costs, Expand Net

Terminal Transactions

LONG BEACH, Calif. – Administrators at the 300-bed Long Beach Community Hospital (LBCH) here said they cut DP costs by more than 50% when they replaced a leased computer and communications terminal system with a purchased system.

The network is comprised of eight terminals and one slave printer in four separate locations. The terminals are linked by either hard-wired connections or in-house dial-up private lines to a multiterminal, multilingual Hewlett-Packard (HP) 3000 system, according to Nancy Riley, LBCH's data systems manager.

The system handles all patient financial recordkeeping, billing, personnel records, general bookkeeping and other administrative tasks as well as pulmonary function analysis and laboratory quality control.

"The computer system has halted increases in the size of our business office," according to Arnold Loveridge, the hospital's associate director. "Hospitals which have gone the route of larger business offices are finding they are still growing with no end in sight."

LBCH is doing the job for the same money and is getting expanded DP and data communications capability at the same time, he added.

The HP 3000 supports five HP 2640A interactive display terminals used in program development and located in the DP center with hard-wired communications to the mainframe, Riley said.

It also supports one HP 2640A in the hospital controller's office operating at 1,200 bit/sec through a Gandalf Data, Inc. modem and an acoustic coupler.

A Lear Siegler, Inc. ADM-3 in the hospital pharmacy and an Asciiscope CRT with a Texas Instruments (TI) slave printer in the respiratory therapy department transmit data at 300 bit/sec to the CPU over private dial-up lines maintained by a private company, Riley said.

The HP system replaced a leased Xerox Sigma 5 CPU with four disk drives, one tape drive and only two terminals. "The $11,000 monthly rental payments for our old system were more than our present purchase payments," Loveridge said. "In three and a half years, we will have our own system."

"It was a question of either expanding core in the old system, which would have involved a significant cost increase, or finding another processor that could handle the job," Riley added.

The HP 3000 performs, for nearly half the cost, essentially the same administrative functions as the larger leased computer it replaced, Loveridge said. However, even more important than dollar savings is the expanded capabilities of the in-house system LBCH now has, he added.

LBCH's computer and terminal network handles nonclinical paperwork associated with hospital operations. Administrative data is sent to the processing center on a regular schedule, keypunched on cards and batch processed by the HP 3000.

Although LBCH programmers utilize the five interactive terminals, often used for data entry, Loveridge has found card data entry is more economical for the hospital's purposes. "Since most of our data is processed only once a day, we have found no benefit to CRT data entry," he said.

"Keypunching is faster and more efficient for our present application. It frees our terminals for programming purposes and real-time calculation," he explained.

Admission and registration forms for all patients, including inpatient, emergency and outpatient, are sent to the data processing center every evening. At midnight, the keypunched cards are read into the system by an HP 2893 card reader and stored on one of two magnetic disks.

Programs update all patient information, produce hard-copy reports on an HP 2618 line printer and then permanently store the results off-line on two 1,600 bit/in. tape drives.

Reports include lists of patients admitted, discharged and transferred. Patient census reports are compiled by nursing station and bed and sent to each nursing station for verification.

Billing Procedure

For billing, an account is opened for each new patient and all charges are recorded daily. Five days after dismissal, the computer produces a detailed listing of all charges, spelling out the date and the amount of each individual service.

Once the bill is paid, the computer sends a follow-up statement to verify the closing of the account. Overdue accounts are taken from the file a month after the first statement; reminders are printed and dispatched by the system on a preprogrammed basis until payment is received.

Another program takes all billing statistics and manipulates them for hospital accounting purposes, keeping track of all account balances and posting payments made.

Accounts payable information is entered into the system once a week. The system writes checks for all invoices to be paid that week while collecting and recording the information for expense distribution for various hospital departments.

At the end of each month, this information, along with data from payroll, purchasing, dietary and maintenance, is transferred into the general ledger. Income and expense statements, budget reports and balance sheets are then prepared by the computer system.

The computer system also keeps track of all of the hospital's fixed equipment and capital assets for cost-accounting purposes.

Payroll maintenance is also the responsibility of LBCH's system. Time card information, once keypunched in, allows the HP 3000 to calculate each employee's wages, make the appropriate deductions, print the checks and charge the appropriate departments for the outlay.

Budgeted man-hour reports as well as overtime exception reports and departmental personnel rosters are by-products of this system. Changes in staff or pay

(Continued on Page 28)

How to increase programmer productivity in a COBOL shop .... for $30

When you think of it, programmer training is pretty haphazard. After a few language courses, a programmer goes into on-the-job training. Which usually means, he's on his own. So if he ever does learn to write efficient, easy-to-read, easy-to-maintain programs, it's largely through his own doing.

A few weeks ago, for example, I looked through the listings of several COBOL programs written by a senior programmer in a medium-sized System/360 installation. To my surprise, the programs were poorly written. They were written in an almost impossible to understand style; there was no structure to the programs, and there were many inefficient coding practices throughout.

My consultant friend tells me that this isn't unusual at all. In addition, he says all too many COBOL programmers are ineffective when it comes to testing and debugging. And they are dreadfully slow when they have to write unfamiliar routines.

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First, we have a COBOL book that is a programmer's guide extraordinaire. Because it illustrates and explains all the major types of routines that an applications programmer is likely to write, it can save hours of research time. Not to mention coding, compiling, and debugging time.

Second, our COBOL book gives detailed procedures for testing and debugging. So a programmer can use it as a guide to efficiency in this critical area.

Third, we have two assembler language books (one for DOS, one for OS). These books are so effective that hundreds of programmers have learned BAL from them without any outside assistance. So if you have programmers that can't debug by using assembler language output, one of these books is a must.

Fourth, both our assembler language and COBOL books are loaded with down-to-earth, practical, real-world advice. It's like being able to talk to the lead programmer without interrupting his work. As a result, our books can provide job enrichment at the same time they increase programmer productivity.

Who These Books Are For

Although thousands of companies have bought our books for inhouse training, we believe they're equally good as programmers' guides.

In fact, we believe every System/360-370 Installation can profit by having at least one copy of the appropriate assembler language book along with one COBOL book. At $30 for the pair, you don't need much programmer improvement to justify this investment. And in most shops, there's so much to gain.

For instance, the COBOL book covers subjects such as: how to design programs so they are easy to debug and maintain; how to use INSPECT and EXAMINE for isolating free-form input fields; how to improve coding efficiency by using the source statement library; how to improve processing efficiency by using SET and SEARCH for table handling; how to write and call subprograms; how to create and process indexed files; and how to use relative files for special file handling situations. This book covers DOS and OS considerations as well as 1968 and 1974 ANSI standards. It's only major omissions are sort, segmentation, and report writer.

As for the assembler language books, they include subjects like: how to write a subprogram that can be linked to a COBOL program; how to write a routine for bit manipulation or code translation when COBOL is inefficient; how and when to use assembler language for processing ISAM or direct files. And always, these books give that extra level of understanding that can turn an average programmer into an outstanding one.

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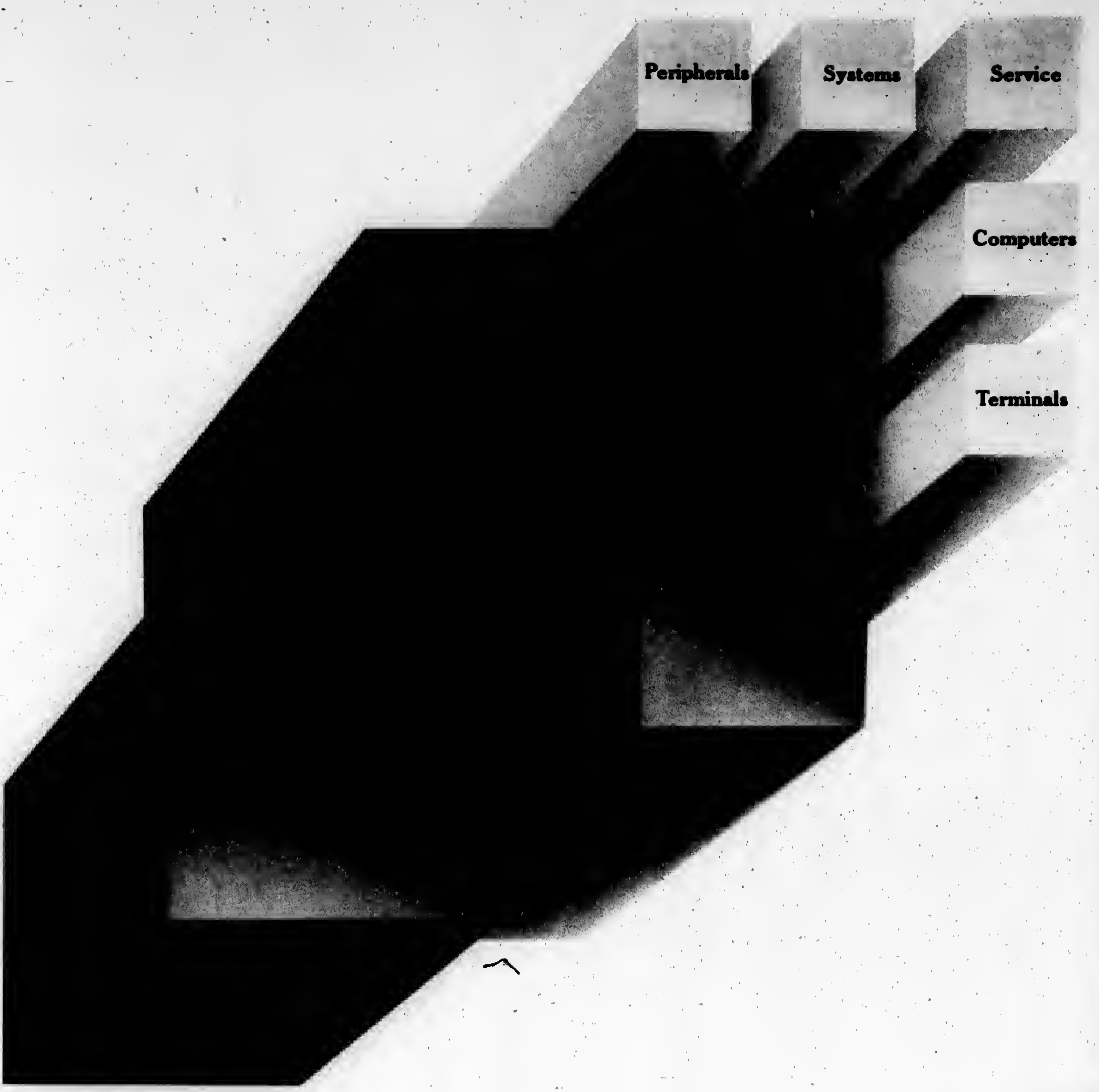

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BR Banktran Software Now Burroughs-Compatible

TRUMBULL, Conn. – Bunker Ramo Corp. (BR) has made its Bank Control System 90 Banktran software compatible with Burroughs Corp. mainframes and has also added a passbook validation/journal printer to the System 90.

In its Burroughs-compatible mode, the System 90 appears to the host CPU as a cluster of display terminals operating on a multidropped synchronous or asynchronous communication line at speeds up to 4,800 bit/sec, according to a BR spokesman.

Burroughs' standard poll/select line procedures for its TD 700, 800 and 820 display terminal series are supported by Banktran in a polled environment, he added.

These procedures include specific poll to a single terminal for the TD 700, group poll for logically related terminals for the TD 800 and, for the TD 820, fast and broadcast select features which reduce the amount of time necessary to write host data to one or several screens, the spokesman noted.

BR's Bank Control System 90 branch administrative terminals support many Burroughs terminal keyboard operational features, including blanking, blinking, intensification, forms mode, tab stops and special editing functions, BR said.

The task of configuring, modifying and down-line loading an operational System 90 from the Burroughs mainframe into the BR branch processor is handled by BR's host-resident Program Support Package (PSP) provided with the System 90, the company said.

Availability of the Burroughs compatibility for the System 90 is scheduled for the second quarter of 1977. The software is bundled in the price of the System 90, the spokesman noted, but he would not quote prices for the system.

The Model 90/86 passbook validation/journal printer for the System 90 performs all on-line teller station documentation functions, the company claimed.

In addition to either dedicated or shared-use capability at the bank teller window, the printer may be shared by several tellers as a back-counter device with a multiteller option, the spokesman noted.

The printer prints up to 96 char./line on inserted documents and 40 char./line on the integral two-part journal roll, he said.

Dot matrix impact printing is said to be performed bidirectionally. All alphanumeric characters and special symbols may be printed in single or double width, the spokesman added.

BR spokesmen also refused to give prices for the Model 90/86 printer.

The company is located at 35 Nutmeg Drive, Trumbull, Conn. 06609.

MI^2 Adds Interactive Printers

COLUMBUS, Ohio – MI^2 Corp. has introduced two versions of an interactive printer terminal with switch-selectable half- and full-duplex operation.

The Design 2400 keyboard send/receive (KSR) terminal is capable of character-by-character operation at speeds from 300- to 1,200 bit/sec, as is its receive-only (RO) version; both terminals can print at speeds to 180 char./sec, according to a company spokesman.

The KSR version comes with an RS-232C interface and a 320-character buffer based on a Fairchild Semiconductor hard-wired 64- by 8-bit word random-access memory chip, he said.

Communications flexibility is said to be enhanced by an optional programmable protocol interface board which incorporates an Intel 8080 microprocessor. The micro can be factory- or user-programmed to meet multiterminal demands, he said.

Terminal Transactions

Data can be transmitted from the Design 2400 KSR at speeds of 75- to 9,600 bit/sec in half- or full-duplex and echoplex modes, he added.

Both printers can accommodate up to 158 print columns and have dual six-pin tractors adjustable for paper widths up to 15-1/2 in., the firm said.

In addition, the KSR unit features a 128-character Ascii keyboard with a 12-key numeric pad for data entry formats; automatic bidirectional printing through utilization of the 320-character optional buffer; and standard or elongated matrix characters in 4 by 7, 5 by 7 or 7 by 9 dot format, the spokesman noted.

The Design 2400 KSR model is priced at $4,440; the RO version costs $3,295. An RS-232C interface option for the RO version costs $200.

No price has been set for the microprocessor-based programmable interface option, the spokesman said from 1212 Kinnear Road, Columbus, Ohio 43212.

Hospital Cuts Costs And Expands Network

(Continued from Page 26)

scale are input every two weeks to update the employee data base.

The computer and terminal system additionally handles the problem of monthly nursing schedules. Individual preferences are entered into the CPU and then shuffled to make sure that each shift is covered with a minimum of personal inconvenience. Daily staffing reports ease the job of keeping track of personnel on duty.

More on-line terminal access has resulted in greater opportunities for real-time scientific computation and evaluation, Loveridge said. LBCH medical technologists are now using the terminals to speed their analyses.

A remote terminal in the respiratory therapy department ties directly into the system via telephone lines for a variety of pulmonary function calculations.

The results of spirograms, blood gas analyses and even cardiology evaluations of left ventricular function are evaluated by the CPU and printed at the terminal in a matter of seconds, a process that used to take hours.

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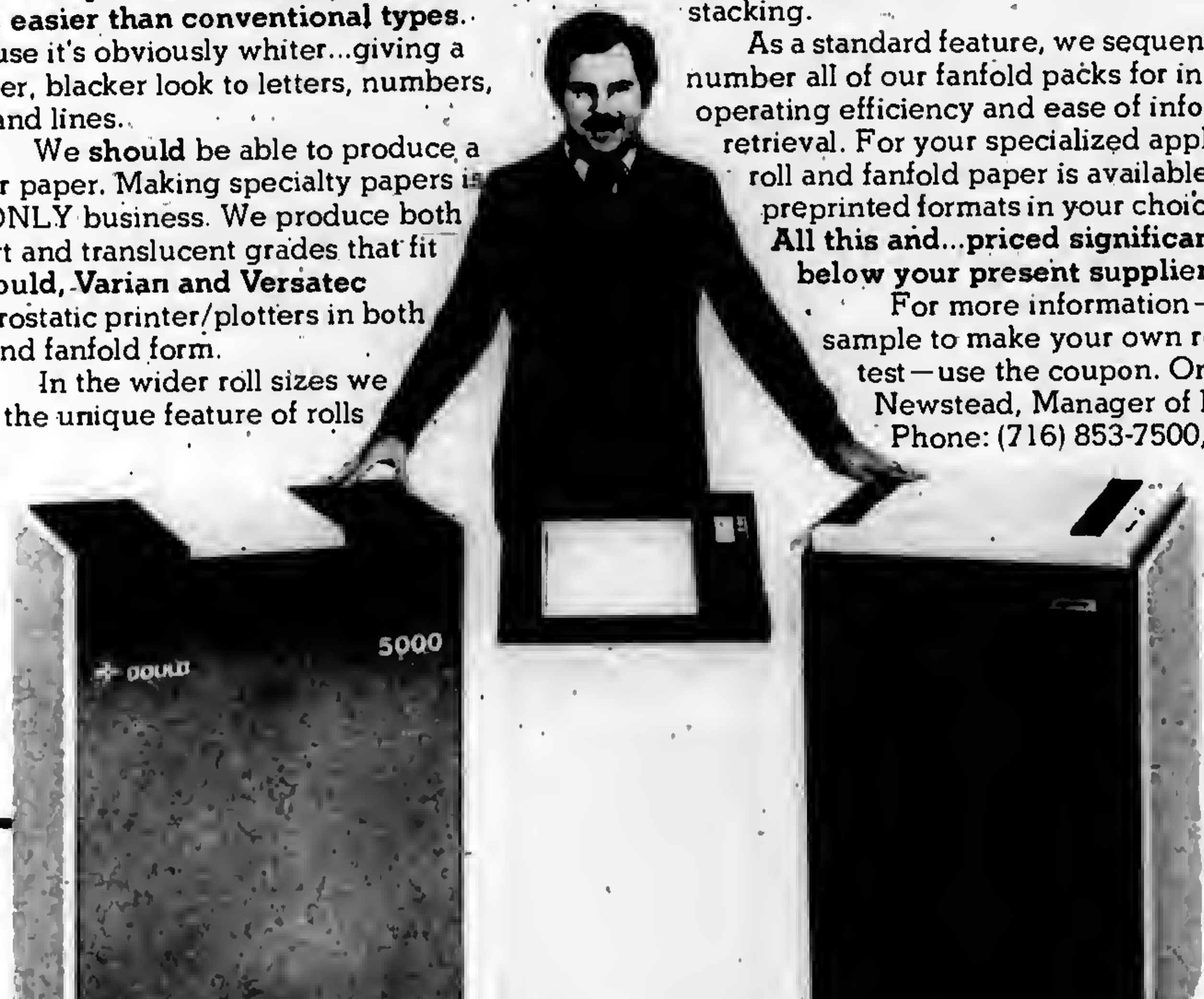

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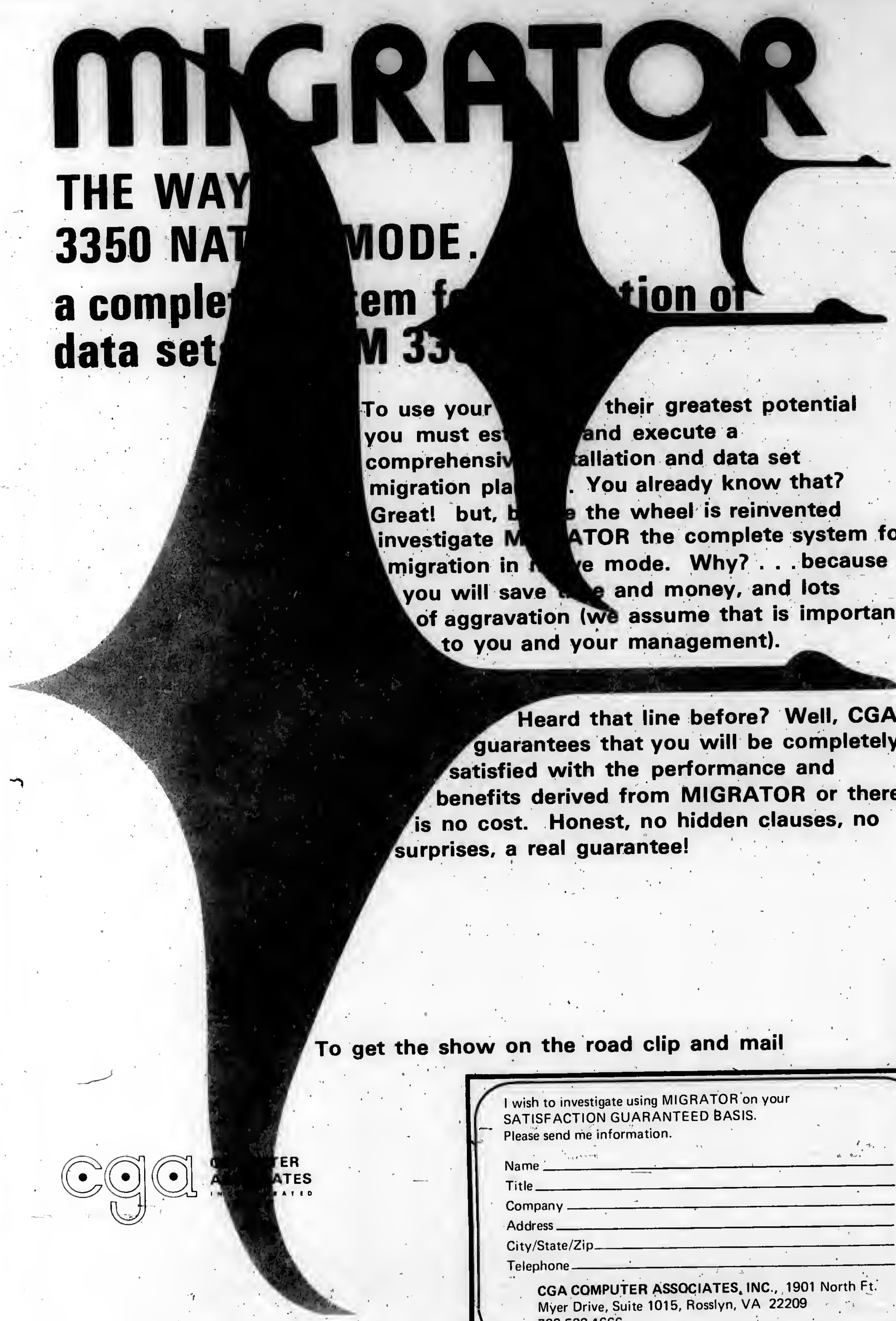

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User Attaches Memorex Disk Drives to Amdahl 470V/6

By John P. Hebert
Of the CW Staff

BIRMINGHAM, Ala. – The ninth user of an Amdahl 470V/6 is also reportedly the first such user to attach Memorex Corp. Model 3670 and 3675 disk storage drives to a 470 CPU.

Liberty National Life Insurance Co. here not only experienced a smooth installation of the 100M- and 200M-byte Memorex disk drives on the Amdahl machine, but is saving about $5,000 every month by not upgrading its previous mixture of IBM disks to IBM 3330s.

The company's life insurance policies in force grew 24% to $8.3 billion during 1975. Because of the rapidly increasing activity required of its data center, expansion of processing capacity and off-line storage became necessary, according to John Lovin, vice-president and DP director.

Liberty's 1.5M-byte IBM 370/155 was replaced by the Amdahl 470 because the 155 wouldn't have been able to handle the increased applications the company planned for future implementation, Lovin said.

The 370/155 was loaded to its limits with 2.4G bytes of off-line Memorex and IBM disk storage, he noted.

'Casual Look'

Liberty "looked at Amdahl casually for about a year" while studying the alternatives of upgrading to either two 370/158s in an MVS environment or one water-cooled 370/168 CPU, Lovin recalled.

The choices were narrowed down to the 470 and the 370/168; after Liberty discovered it would be unable to get delivery on the IBM mainframe in the timeframe required, the company turned to Amdahl.

Amdahl proposed that Liberty personnel visit some 470 installations and Amdahl headquarters. After seeing the sites, Lovin felt the 470 would provide the needed power and handle the processing load; it was also a better price, he added.

"We saved $300,000 in the initial purchase price over a 370/168 and well over $100,000 in physical upgrades" which would have been necessary for the installation of the water-cooled 168, he said.

These changes to the computer room would have included installing water chillers and upgrading the DP center's air-conditioning equipment, he noted.

IBM Drives Returned

When it came time for Liberty to increase the off-line storage on the Amdahl machine, Liberty found it could save money by returning its eight IBM 2314 disk drives with eight 200M-byte spindles and eight spindles of IBM 3330 single-density disk drives with 800M bytes of storage to a third-party lessor, according to Robert Clayton, operations manager for Liberty.

Liberty then turned to Memorex for one 3675 disk drive with eight spindles and 1.6G bytes of storage – which cost the same as the previous 1G bytes of IBM disk storage, he said.

The present configuration includes the 2M-byte 470V/6 CPU, four user-owned IBM 3330s, four Memorex 3675s and three Memorex 3670 disk drive modules amounting to 3G bytes of off-line storage – 600M bytes more than the 370/155 configuration allowed, Clayton said.

The entire Memorex equipment configuration consists of four 3675 disk drive modules and one 3673 disk controller connected to one block multiplexer channel via a Memorex 3672 storage control unit (SCU).

A second string of Memorex drives consists of three 3670s connected to a separate channel via the SCU.

The SCU allows expansion by adding up to four 3673 disk controllers with optional string switching. Each 3673 can control up to four 3670/3675 drive modules. A total of 32 drives, or 6.4G bytes, is accessible on one channel, Clayton explained.

Throughput Up 600%

The Amdahl CPU has brought an increase in throughput of approximately 600%, Clayton claimed, because of its faster cycle time of 32 nsec, coupled with the 27 msec average access time and 806 kbyte/sec transfer rate offered with the Memorex drives.

In addition, the CPU allows the use of more channels for peripheral attachment, he noted.

The initial Amdahl installation emulated the 370/155's four-channel operation. To take advantage of the 16 channels available on the 470, several minor changes were made in the operating system (MVT 21.8), he said.

Additional coding was incorporated within the operating system to accommodate machine and channel check handling

(Continued on Page 35)

Burroughs System Encodes Micr, OCR

DETROIT – Burroughs Corp. has introduced the S 500 Document Management System which it said provides banking, commercial and governmental organizations with a choice of system capabilities in preparing documents for electronic reading by other machines in data entry applications.

Burroughs S 500

The S 500, a single-pocket encoder, features an electronic keyboard and programmable code line, Burroughs said. It can encode documents in either magnetic ink character recognition (Micr) or optical character recognition (OCR) type fonts.

The primary Micr use of the system will be in proof of deposit operations which prepare Micr-encoded documents for processing, according to a company spokesman. The system will also be applied to proof and receipting operations involving OCR-encoded utility bills, insurance premium notices, credit card slips and loan coupons, he said.

The S 500 utilizes programmable read-only memory (Prom); this provides the unit with a fully programmed Micr/OCR code line with one to eight fields. Once identified and defined, the Prom program sequences the encoding operation automatically, Burroughs said.

Documents which pass through the system are visible at all times. Encoding and audit trail printing occur in parallel and the last printed line on the audit tape is visible to the operator, the spokesman added.

Communications lights take the operator step by step through the encoding operation. An electronically buffered, standard 10-key keyboard stores both numeric and control information for up to 21 print positions, he said.

Fields are encoded in a controlled index sequence on the S 500. Exception item encoding as well as normal proof of deposit encoding is available by selecting the field keys only for fields to be encoded outside the sequence; no program changes are required, Burroughs said.

Documents are transported through the encoder at 75 in./sec. Combined with the S 500 audit tape lister which prints at 2.5 line/sec, the S 500 can encode a 10-character amount field at 60 document/min.

Options available include check digit generation, check digit verification, index capacity checking and productivity counters.

The S 500 costs $7,450 and leases for $215/mo on a three-year contract.

Israeli Firm Saving Disk by 'Hiding' Files on Tape

By Alex Ragen
Special to Computerworld

JERUSALEM, Israel – By "hiding" infrequently used disk files on tapes without the owners' knowledge, the Office Mechanization Center (OMC) here has slashed its ballooning requirements for more disk space.

A service bureau for most of Israel's government agencies, OMC has grown in eight years from a modest IBM 1401 installation to a 2M-byte 370/168 shop supporting two remote job entry terminals as well as dozens of Time Sharing Option (TSO) users all over the country.

In addition, the system supports on-line telecommunications to Ben Gurion Airport customs officials.

Since the installation of TSO two years ago, the demand for additional disk storage capacity has far outstripped the supply. Management's first reaction was simply to order more drives, but users' appetites for disk space were stimulated rather than satiated by increasing the supply.

Now OMC periodically removes low-use files from the crowded disks and transfers them to tapes (it has 8,000 in its library). A specially written routine linked with the VS2 OPEN SVC restores such files to disk as they are requested.

The entire system is transparent to the user, who ordinarily does not know whether his files are on disk or tape.

Changes were also made in the FORMAT 1 DSCB which allow the system to keep track of file usage and to determine whether the tape version of a file is identical to the disk version in order to minimize unnecessary copying.

After a year of operation, the method is considered a huge success. It won the Data Processing Systems Prize of the Information Processing Association of Israel last year.

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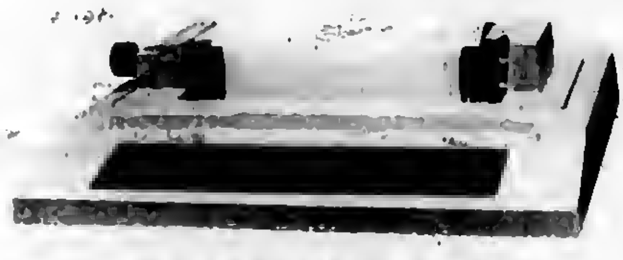
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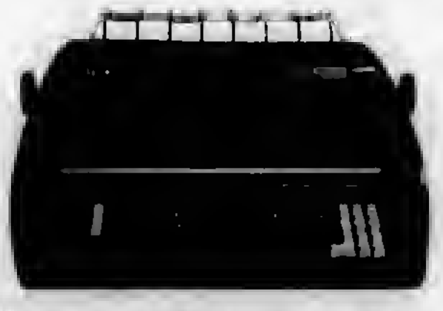
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Van Line Moves to Key-to-Disk, Cuts Error Rate 90%

ST. LOUIS – United Van Lines lowered its error rate on freight bills by 90% after switching from keypunch machines to a key-to-disk data entry system, according to the user.

The system also allowed the moving company to increase its data entry throughput by at least 30% while lowering costs at the same time, according to Elinor Sirota, manager of computer and technical services.

United Van Lines is saving approximately $300/mo on equipment costs alone after replacing six IBM Model 029 keypunch machines and four verifiers with an Inforex 1303 and nine keystations, she estimated.

In addition, the firm is saving $3,000 each year on punch card costs and approximately $200/mo on overtime charges for a card reader, she said.

"We had 13 people on our data entry staff when we first installed the system four years ago," Sirota recalled. "Now we have 14 people, but in those four years our revenues have increased by about 30%.

"Where we had processed an average of 500 to 600 freight bills daily, we are now processing closer to 800 freight bills – a total of more than 300,000 records every month.

"If we still used keypunch machines, we would have needed at least 20 people in data entry to handle that increased workload," she said.

The major application for the company's data entry system is revenue distribution for the domestic division, which operates United's household goods moving business.

Freight bills entered on the key-to-disk system prior to processing on an IBM 370/145 contain information on all charges relating to a particular move. From that document, the mainframe determines how revenue from each move will be distributed among United and each of its agents involved with that move.

The key-to-disk system is also involved in revenue distribution for United's flatbed division, its electronics division and its international department. In addition, it is used in processing bills for freight other than household goods, for entering information from drivers' logs and for all data entry relating to the company's general accounting.

United began to explore alternatives to the keypunch machines it had been using because they did not have a sufficient number of program levels to accommodate the amount of information United needed to enter, Sirota said.

"We were outgrowing the three program levels we had available, and it would have been cumbersome for us to key our information within the constraints of those levels," she explained.

"We might have had to use different program drums, split a billing sheet between two keypunch operators or even break up the billing sheet into separate sheets to get all of our information entered in such a way that the computer could access it and prepare all of the vouchers and other documents we require."

Keypunch supervisor May Johnson explained that in the principal application – household goods revenue distribution – keystation operators can now enter data in any of seven records within one of eight program levels.

The software is written so the operator must enter data pertinent to each record in sequence, and Johnson noted United Van Lines' billing sheets have recently been reprinted to coincide with that record arrangement, making it easier to train new operators.

Experienced keypunch operators were proficient on the systems about a week after installation, she added.

Busy Season

During the summer months, the beginning of United's busiest season, as many as 1,200 billing sheets arrive in the data entry room each afternoon.

"The information on those billing sheets is very inclusive," Johnson said. "It spells out things like how many flights of stairs are involved, connecting and disconnecting appliances by other service people – even special items like pianos."

The key-to-disk equipment allows that information to be entered and, if necessary, corrected more quickly than was possible using keypunch machines, Sirota said.

Because of the way United arranges its data, it can store up to four times the amount of data on disk than previously, reducing the frequency at which data must be dumped from disk to tape.

The average keypunch operator produced approximately 8,000 keystroke/hour compared with 12,000 keystroke/hour for the average 1303 keystation operator, Sirota said.

"Now it takes an operator about one minute to key a freight bill. When we used the keypunch, it took closer to a minute and a half. The key-to-disk system saves us approximately 40 hours of data entry time each month, and most of that was overtime," she added.

The error rate on freight bills using keypunch machines was approximately 1%, Sirota said. Now, with the key-to-disk system, the error rate is less than one-tenth of 1%.

After each operator keys each batch of freight bills, a different operator verifies accuracy by rekeying that same batch. A light flashes each time the verifying operator keys a character different from that keyed by the original operator, she explained.

"We also use the system for balancing in our accounting application, and we are now able to make corrections on the controller without having to use our 370," Sirota noted.

An expanded tape-processing feature on the 1303 allows United to search tapes and update and correct data on tape.

"Another advantage is that we can interrupt a job, then come back to it later. It was a lot easier to lose track of cards if that happened under the old system," Sirota said.

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Single-Frame Unit Uses 16K RAMs

Intel Add-On Expands 370/125 Memory to 1M Byte

SUNNYVALE, Calif. – An add-on memory system which allows IBM 370/125 users to expand 64K bytes of IBM memory to 1M byte has been introduced by the Intel Memory Systems Division of Intel Corp.

The In-7125 single-frame semiconductor memory system uses 16K random-access memories (RAM) to provide a compact storage unit, Intel said.

All specifications of the In-7125 meet or exceed IBM specifications, a spokesman claimed. Its access time of 290 nsec is shorter than that of standard IBM memory and its cycle time of 480 nsec is equal to that of IBM memory, he said.

The Intel memory looks like IBM memory to the Model 125 CPUs, he added. It plugs into the mainframe and requires no changes in CPU operation or user software.

The 16K RAMs reduce the number of storage elements per system by four to 16 times compared with previously used RAMs, Intel said.

Diagnostic Capabilities

The system is compatible with IBM diagnostics and also provides additional Intel diagnostics. It attaches to both the 370/125-1 and 370/125-2.

The In-7125 is said to require less power and air conditioning and is higher in reliability than previous add-ons.

The In-7125 costs $790/mo with maintenance on monthly rental and $720/mo with maintenance on a 48-month lease. The purchase price is $18,900.

First deliveries are scheduled this month, the spokesman noted from 1302 N. Mathilda Ave., Sunnyvale, Calif. 94086.

In-7125 Add-On Memory

Bar-Code Reader Links to CRT

MOUNTLAKE TERRACE, Wash. – A bar-code reader that is said to offer dual connectors to facilitate tandem operation with a CRT or other on-line terminal is available from Interface Mechanisms, Inc. (Intermec).

The dual-connector feature of the Model 9110 allows parallel connection with any on-line RS-232C-equipped terminal, the firm said. Communication between the computer and terminal is transferred through the reader, a spokesman added.

The reader includes the Intermec Ruby Wand light pen for scanning bar-code tags or labels. Suited to production and inventory control data reporting requirements, the reader presently reads Intermec's Code 39, an alphanumeric bar code that features additional human-readable text immediately above the code, and Code 11, a high-density numeric code with a check digit, the company claimed.

Variable-Length Messages

The Model 9110 reads variable-length messages up to 32 characters. The bar code can be bidirectionally scanned at 3- to 25 in./sec with the light pen; an audio signal confirms a correct read, according to the spokesman.

The reader's communications interface is compatible with asynchronous bit serial rates from 110- to 9,600 bit/sec, the company said.

The Model 9110 costs $1,085 from Intermec at 5503 232nd St. S.W., Mountlake Terrace, Wash. 98043.

Memorex Disks Put On Amdahl 470 CPU

(Continued from Page 31)

and to recognize the Amdahl console, he explained.

This console is a minicomputer with an integrated CRT display, contrasted to the previous keyboard console with separate CRT.

Completely Compatible

The 2M-byte 470 is 100% compatible with all of Liberty's previous hardware and software, including Sanders Associates, Inc. Model 804 intelligent batch terminals at 143 remote field offices, 50 IBM 3270 CRT terminals here at company headquarters and an IBM 3705 communications processor, Lovin said.

Another instance of compatibility and throughput power advantages over the previous 370/155, Lovin said, is that the Amdahl machine can handle processing from an IBM 360/20 at a Liberty office in Illinois on a remote job entry basis.

"We didn't have the capacity to do that job before," he said.

Lovin said he was pleased with both the Memorex and Amdahl personnel and with the outcome and cost savings of the installation.

Three Engineers

Maintainability "is the outstanding feature of the Amdahl machine," he added. "If it goes down, we get a rapid response from the three Amdahl on-site engineers. Besides, the machine is designed so it's easy to maintain and trouble-shoot.

"We will be able to process more applications and the DP costs will be less in future years," he said.

COMPUTER MANAGEMENT
United Kingdom

World rank as DP market: *Fourth*
1975 DP expenditures: *$2.7 Billion*
1975 imports from US: *$270 Million*
Rank as importer from US: *Third*

Computer Management is a monthly magazine recently purchased by Computerworld, Inc. Monthly circulation is 30,000.

COMPUTERWOCHE
Germany

World rank as DP market: *Third*
1975 DP expenditures: *$3.7 Billion*
1975 imports from US: *$274 Million*
Rank as importer from US: *Second*

Computerwoche is a weekly tabloid newspaper started by Computerworld, Inc. It has a circulation of 21,000 to the West German computer community.

SHUKAN COMPUTER
Japan

World rank as DP market: *Second*
1975 DP expenditures: *$4.6 Billion*
1975 imports from US: *$189 Million*
Rank as importer from US: *Filth*

Shukan is a weekly tabloid newspaper, jointly owned by Computerworld and Dempa publications. Circulation is 35,000.

Zero-Un Informatique
France

World rank as DP market: *Fifth*
1975 DP expenditures: *$2.5 Billion*
1975 imports from US: *$223 Million*
Rank as importer from US: *Fourth*

Computerworld represents **Zero-Un Informatique** in the U S Zero-Un has three publications, one a weekly tabloid newspaper with circulation of 22,000, the second a monthly magazine, circulating 13,000 copies, and a new bi-weekly, Minis and Micros. All circulate throughout Europe's French speaking computer market.

DATANEWS
Brazil

World rank as DP market: *12th*
1975 DP expenditures: *$250 Million*
1975 imports from US: *$60 Million*
Rank as importer from US: *(Est) 10th*

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COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

NBI Preprogrammed Word Processor Works With Diskette Instead of Cards

BOULDER, Colo. – NBt, Inc. has introduced a factory-programmed word-processing system designed as a replacement for magnetic card-type systems.

The NBI System I reportedly features a single diskette capable of storing 50 pages of text in addition to the fixed-format, preprogrammed system software.

It also includes a page-oriented, 1,280-character CRT for display of text in 9 by 16 dot-matrix characters and has a 30 char./sec bidirectional printer, according to an NBI spokesman.

Once material is entered through the IBM Selectric-compatible keyboard, the operator can simultaneously print one document while typing another, he said, adding information stored on the diskette may be instantly accessed for editing purposes.

Other features include automatic carriage return, super- and subscripts, simplified repagination and document assembly capability, NBI said.

An optional extended word-processing package for System t includes automatic centering capabilities, decimal tabulation, stop and switch codes and an electric typewriter mode, the company added.

Purchase price for the System I is $9,900; the extended word-processing option costs an additional $1,300, NBI said from 5595 E. Arapahoe Ave., Boulder, Colo. 80303.

Univac Enhances Accuscan System

BLUE BELL, Pa. – An upgradable key entry system for its Accuscen supermarket checkout system is available from Univac.

The system was designed to minimize store operation disruption if a control center failure occurs, Univac said. It features a modular register that has intelligence and allows the front end to continue operation if the in-store mini is down.

The register includes a customized keyboard, 32-character alphanumeric printer, a 5-character numeric display, cash drawer and a combination register stand/control unit, the firm noted.

Optional devices include an 18-character dot matrix display, remote cash drawer, utility drawer for the register stand, electronic scale adapters, coin dispenser adapter and Universal Product Code (UPC) scanner.

The control center may be either a single or dual processing system, Univac said. The single processing system includes the control and a choice of five file storage sizes; a communications adapter or tape cassette unit can be attached to the control center, the firm added.

A basic eight-checkout key entry system costs $42,1t0 without maintenance. Univac can be reached at P.O. Box 500, Blue Bell, Pa. 19422.

Ampex Adds Memories

EL SEGUNDO, Calif. – Ampex Corp. has a series of core memories that are compatible with the Ampex t600 series and the Electronic Memories & Magnetics (EMM) Micro 3000.

The 3220 series memories have a capacity of 32K words and are available as either modules or memory systems including card racks, the firm said.

The units have access and cycle times of either 275- and 650 nsec or 290- and 750 nsec and cost about $2,000 in OEM quantities, Ampex said from 200 Nash St., El Segundo, Calif. 90245.

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Birth of Incorporated Micro Forecast

Death of Disk Controller Seen in Mini Memory Future

By Esther Surden
Of the CW Staff

SAN FRANCISCO – Memory products of the future will not only be more reliable and less costly, they won't even look the same, Dr. David George of California Computer Products, Inc. said here last week.

The disk controller will become extinct and, in its place, a bipolar high technology microcomputer built into the disk drive will serve as a controller, George told minicomputer users at the Mini/Micro Conference and Exposition here last week.

"We are entering an era where only the more reliable Winchester-type head will be used," he continued. But because it is difficult to build such a drive with a removable disk, nonremovable media will take over the functions of removable disks, he predicted.

To provide enough storage capacity, the nonremovable disks of the future will need 100M bytes in a single disk; metal film-plated disks with increased reliability and surface properties will also emerge, he forecast.

Faster access time has been achieved, George noted, by placing two heads on each arm. To go beyond this, improvements will have to be made in the design of positioning motors, he said, adding today's more powerful positioning motors already permit access times below 30 msec.

CW at Mini/Micro

When microcomputers are incorporated in a drive, error correction will be easier, George said. It is difficult to test a drive when noise sources exist more often in the cabling than the drive, he added.

With the microcomputer in the disk, there "will be no reason for the system designer to know" buzzwords such as "sectors," "heads" and "disks." All the designer will know is that the disk is a "box that stores files," he said.

The advent of bubble memory and charge-coupled devices (CCD) will also reduce the user's costs, according to Dr. J. Egil Juliussen of Texas Instruments.

A magnetic bubble memory may be accessed by moving the magnetic bubbles to an I/O device while the media remains stationary, Juliussen explained.

CCDs are serial access devices that are packaged on PC boards and feature shift register organization, block-oriented access, bit addressability, volatility and the ability to execute READ, MODIFY and WRITE instructions, he said.

"Essentially anyone who produces metal oxide semiconductors can produce CCDs," Juliussen said.

The first CCD memories were in prototype by 1974 and by 1980 a 256K chip will be available, he predicted.

CCDs could be used as fast auxiliary memory and virtual memory for fast IBM-type storage, he added. They also could be used by minicomputers as a "disk on a board."

Bubble memories, on the other hand, could be used as mini and micro peripherals. The nonvolatile bubble meory has a lower access time than the CCD, which makes it attractive in people-oriented systems, he indicated.

Bubble memory and CCDs will impact users by bringing the total costs of systems down, making memory peripherals match the price of the computer on the board, he said.

Standards Urged

SAN FRANCISCO – Minicomputer disk systems lack the reliability and maintainability of their mainframe counterparts because standards in the "maxi world" are set by companies that sell and support products – and they have to protect their names, according to James Toreson of Microcomputer Systems, Inc.

In the mini world, however, standards "are set by OEM companies who can sell and abandon their products. Wholesale support features are traded for lower price," he told attendees at the Mini/Micro Conference and Exposition here last week.

The disk memory part of the mini world could use standards committees to bring the units up to snuff, he suggested.

Beware of Salespeople Who Promise the Moon

By Jon David
Special to Computerworld

Minicomputer Exchange

Competitive fixed-price bidding situations have been present in the computer industry since more than one source was available for computing equipment. Although one always likes to have the best value per dollar, in competitive situations it is often necessary to take the lowest bid.

Early mini systems, popular in our original aerospace efforts, were almost always "32K" machines. Word sizes were varied, such as 30-, 36- or 48 bits; the number of words, however, seemed to hold to 32K.

In the early days memory was a very, very expensive part of a system. To significantly decrease computer price, one could cut down on memory expense. Since, however, all or at least most systems being considered would have 32K, any system bid with less than that amount of memory might look bad.

To treat such situations, new systems were developed, originally with word sizes of 24 bits.

The systems had many hardware peculiarities and were most frequently delivered with very minimal to nonexistent support programs. To use these systems, one normally had to be adept at both programming and engineering. The buyers of these machines always had long and complex lists of technical questions in both hardware and software areas.

The salespeople of this new breed of machines (now known as minicomputers) were frequently former users and conversant in hardware and software disciplines and the technical applications for which the machines would be used.

It was, at that time, not unknown for the salesperson to be able to take apart and repair a computer, modify or correct system programs and actively help with applications work.

As the power of these systems increased and their price came down, they were considered for end-user commercial situations.

The salesperson selling these business minicomputers typically has no knowledge whatsoever of either computer hardware or software. Moreover, since there are many and varied potential applications areas, the salesperson will be unlikely to have expertise or even thorough knowledge of any particular type of application and frequently does not even

(Continued on Page 39)

MIC Finds Users Unhappy With Vendor Support

By Esther Surden
Of the CW Staff

CHERRY HILL, N.J. – Support, service and maintainability are still thorns in the sides of small business system users, according to a survey by Management Information Corp. (MIC).

More than 200 users with over 300 systems replied to the survey. The users rated the systems on a range of 1 to 4, with 1 equal to "poor" and 4 representing "excellent."

Categories covered were performance, reliability, maintainability, service and manufacturing support.

Of vendors with more than 10 respondees, Burroughs Corp., Hewlett-Packard Co. and IBM scored good or better in all categories.

Datapoint Corp., Digital Equipment Corp. and Honeywell Information Systems, Inc. fell down on service and support, their users said, while Qantel rated an overall good score except for support.

Less than 10 users per vendor was common in the survey. Microdata's Reality, with six users surveyed, was rated good in all categories.

Six for Basic Four

NCR, with seven replies, satisfied its users in every category except manufacturer's support. Basic Four's six users rated support as fair, but the other categories were rated as good.

Olivetti's five users were satisfied with their systems, as were Wang's seven respondees.

Although only three of GRI's System 99 users were identified, the unit was rated good to excellent in all categories. The Lockheed System III was rated excellent by its three users except in the support category.

Minicomputer Systems' Micos was rated excellent in performance, reliability and support, but only fair in maintainability and good in service by two respondees.

The single Prime 300 user who replied rated the system excellent all around.

Over 50% of the users responding use peripherals from independents with satisfactory results, MIC said. Aside from IBM, small business computer manufacturers receiving overall satisfactory rating for their peripherals were Hewlett-Packard and Wang.

Centronics Data Computer Corp. printers, Decision Data Computer Corp. 9600 keypunches, the IBM 5203 printer and IBM 5440 disks were rated good or better by five or more users, MIC noted, but Burroughs users indicated problems in peripherals.

Results of the survey were published in the October "Small Business Computer News," a newsletter available for $51/year from MIC at 140 Barclay Center, Cherry Hill, N.J. 08034.

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Hybrid Disk Drives Seen 'Just Over Horizon' for Minis

By Esther Surden
Of the CW Staff

SAN FRANCISCO — Hybrid disk drives, 6,200 bit/in. magnetic tape drives, solid-state circulating memories and 40M-byte read-only memories (ROM) using film techniques are "just over the horizon," according to Randy Knapp, president of Western Peripherals, Inc.

Speaking at a session at the Mini/Micro Conference and Exposition here recently, Knapp told minicomputer users to give especially careful consideration to their future system needs.

"You may need to install a 50M-byte system now, but you should be aware that expanding this system to 200M- to 300M bytes two years from now could very likely cost you more than you would pay for a new 300M-byte system when the time comes," he cautioned.

CW at Mini/Micro

Hybrid drives will use IBM 3330/Winchester-type technology for combined moving-head and fixed-head disks. The fixed heads will allow quick access to a limited amount of data; the moving heads will retrieve data from larger capacity storage sections, Knapp said.

The hybrid drives will have a 300M- to 400M-byte capacity per module, he added.

Tape drives with 6,250 bit/in. speeds, common on the larger mainframe systems, "should become available very soon for minicomputer users." Within the next several years, he predicted, drives will be available with speeds up to 15,000 bit/in.

Solid-state circulating memories which emulate disks and use existing software will also be available in the next two to three years, he forecast.

A little further off is a development involving 40M-byte ROMs using film techniques, Knapp said.

Mass storage peripherals available to the minicomputer user today often represent the biggest single cost in a total system and sometimes cost more than the computer itself, he noted.

"Even in today's market, 80% of all minicomputer peripherals are supplied by the mainframe manufacturers.

But "virtually any successful independent can supply peripherals that will outperform comparable items from mini manufacturers," he believes.

Today's tape devices include vacuum column and tension arm devices. A tension arm drive operating at 25 in./sec can stop and start in .2 In. without overstressing the tape, but a vacuum column configuration is needed for drives operating at 75- to 250 in./sec, he explained.

"For applications up to 45 in./sec, the tension arm drives have a marked cost advantage and would probably be the configuration most frequently specified," Knapp added.

Two Drive Types

Disk cartridge drives can be classified as either top-loading IBM 5440 types or front-loading IBM 2315 types. The primary consideration in choosing one of these drives is software and media compatibility, he said.

"If your disk system is supplied for a Digital Equipment Corp. PDP-11, is the disk pack used on only one disk drive or must it also be read on another disk system? If so, you are restricted to the 2315-type front-load drive, which is compatible with DEC's RK/05 drive," he said.

"The cost advantage of one-type standardization can be significant because the DP department can pass along volume purchase discounts to other users within the company," Knapp said.

IBM Winchester drives have proven to "be somewhat beyond the means of the average minicomputer user" because their increased density requires use of error-correction codes, making drive-to-computer interfacing more complicated, he said.

Independent peripheral makers have come up with minicomputer disks using Winchester technology but without the error-correction codes, he noted. The barrier "to their widespread use has been the limited availability of software for the mini user."

Minicomputer mainframe manufacturers appear to be on the verge of resolving the software problem, he said, adding those users who need Winchester-type systems now are true pioneers and likely to be "shot and scalped."

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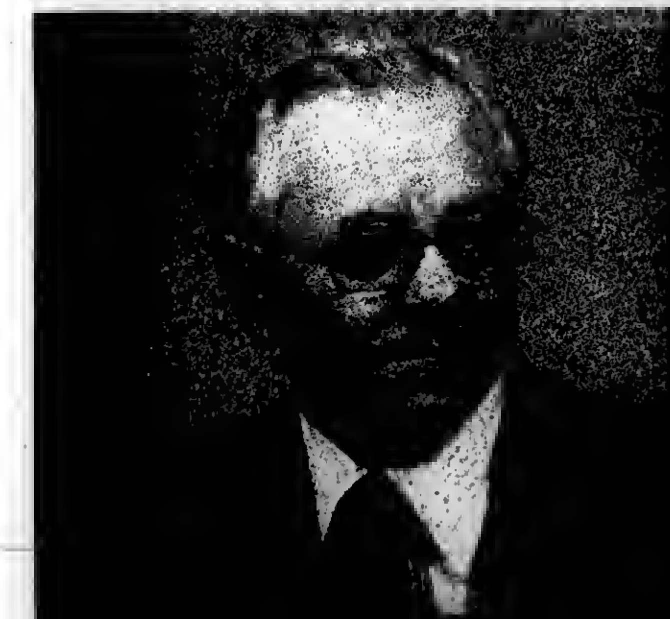

"Exide backs up its UPS reliability claims with a quick-response service department. MCAUTO has had three 200 KW UPS Units in operation since June, 1975 at its St. Louis data center. Eight more Exide 200 KW Units have been installed to provide full emergency power for 15 minutes. And two more are on order. We do depend on Exide UPS."

Theodore Kawula, Section Manager,
McDonnell Douglas Corporation

"When the energy crunch started in late 1973, COMPU-SERV realized that if we were going to continue to provide reliable computing services to our users, we would need to find a reliable, cost-effective 'uninterruptible power source.' After talking with several possible vendors, it became apparent to COMPU-SERV that Exide Power Systems could deliver such a system as a total package in a reasonable time frame. Our 250 KVA UPS has been on-line for over eighteen months now. We are pleased with the increased computing reliability this Exide UPS has allowed us to provide the remote users of our nine large systems."

Len Kaiser, Site Manager, COMPU-SERV

Users Should Beware Sales Reps Who Lack Technical Knowledge

(Continued from Page 37)

have a proper vocabulary.

When one speaks to a minicomputer salesperson today, one can expect a "yes" response to all questions. Occasionally, a vendor technical representative with actual knowledge of hardware and software will be called up to supply details.

We have today a situation in which a user is promised the earth, the moon, the sun and the stars by salespeople who in fact have no knowledge of whether the user can get what he has been promised.

They are not engineers; they are not programmers; they are not systems people; they are salespeople, and their job is to get the user to sign on the dotted line and let somebody else worry about getting it to work.

You want order entry? No problem! Ten concurrent users? Sure! Send out 300 invoices per day? We do it every day!

Giving the salesperson the benefit of the doubt, he believes what he tells you to be true. The company has told him it is true and he can see no reason it would lie to him.

He does not, of course, have the technical ability to evaluate the truthfulness of the assertion.

End users are offered contracts which typically provide for full payment only after satisfactory completion, installation and performance of the system. In addition, clauses frequently specify that all or at least most deposit or other monies paid will be returned if the system is not made to work satisfactorily. With such a contract, how can a user go wrong?

Let us assume it takes six months to develop a system after signing the contract. For this period of time a user is spending considerable time working with the vendor and spending money for forms, electrical work and the like.

The system gets delivered, and it only does half of what it was supposed to do. It can, in fact, never be made to do more than that.

If the user throws it out, he has wasted not only six months of time and incurred certain dollar costs, but he has also reached a point in time where he was depending on certain system functions. If he throws it out, everything is on the negative side; if he keeps it, at least he'll have something — a sorely needed "something."

There are countless situations in which systems performing way under contractual commitment have been accepted because they were better than nothing.

David is president of Minicomputer Industry National Interchange (Mini), a professional society treating minicomputers, microcomputers and associated technological techniques, and is also president of Systems RDI.

Readers are urged to reply to this or any other Minicomputer Exchange article. This is your column, a chance for you to exchange views on the various topics confronting the minicomputer user, a chance to tell the vendors what you are thinking and to let your fellow mini users know about pitfalls or new techniques in this area. Letters or manuscripts should be addressed to Minicomputer Exchange, Computerworld, 797 Washington St., Newton, Mass. 02160. Double space, please.

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Computerworld's November 29th issue will include a special report, edited by Ron Frank, on *Data Communications Network Configurations*. The supplement can show you some of the right ways to plan your network -- and how to avoid common pitfalls. In addition to case studies and commentary from well-informed users who understand the data communications environment with all its implications, you'll find applications stories and tutorials on the equipment, carrier services, line protocols, teleprocessing software, etc. that's available to make up your system.

So whether you're building a network or managing one, you'll find important and useful information in the November 29th *Computerworld*. And if you're marketing data communications products or services, you should advertise to your audience here. The ad closing date is November 12th. Talk to your *Computerworld* salesman for complete details. Or call Judy Milford at (617) 965-5800.

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First Church of Christ Scientist, Boston, Mass.

"Mr. Stimler presents his material in the seminar as he does in his books - with clarity and conciseness, devoid of 'computerese.' Here is a practical methodology for putting data processing and associated services on a scientific, businesslike basis that top management can understand and appreciate."

Robert Barrow, Performance Controller
Rhode Island Hospital Trust National Bank, Providence, R.I.

"First, I would like to commend Mr. Stimler, who is a rare individual, with a great deal of knowledge of experience, who can impart his knowledge in very clear and precise language. This seminar has reminded me that very complicated situations can be broken down to manageable and understandable parts. I feel that with this beginning, I can proceed to begin to measure and evaluate our computer system."

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Saul Stimler is the Seminar Leader

Saul Stimler is President of Stimler Associates. He is a 16-year veteran in data communications and data processing. He has provided in-house training, specification preparation, design, evaluation, performance improvement, system planning, benchmarking and project management consulting services for leading companies and government agencies in the United States and Canada. Mr. Stimler is the author of the highly acclaimed book, *Data Processing Systems - Their performance, evaluation, measurement and improvement*, and this book will be an important part of the course materials. Advance copies are available - see the coupon below.

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CI Notes

Memorex Denied Injunction On IBM Pricing of Drives

MOSCOW, Idaho – Memorex's preliminary injunction to require IBM to separately price and offer disk drives and disk packs in its 3344 and 3350 product line has been denied by Federal District Judge Ray W. McNichols.

"We are obviously pleased with the decision," an IBM spokesman said.

The 3344 and 3350 products differ from previous equipment in that the disk packs are bolted to the drives and not available separately [CW, Sept. 6].

Memorex, which had contended that pricing the two together violates antitrust law, intends to press the point again when its main antitrust suit against IBM comes to trial next year, according to a company spokesman.

Data 100, Univac Sign Accord

MINNEAPOLIS – Data 100 Corp. has signed a multiyear agreement with Univac to supply line printers for use in a yet to be announced family of business-oriented computer systems for a broad range of applications.

The agreement, which runs through 1979 with an additional two-year option, could reach a value of $15 million.

Under the terms of the agreement, Data 100 will provide volume shipments of 80-, 125- and 250 line/min printers.

DG Moves R&D to North Carolina

SOUTHBORO, Mass. – Data General Corp. (DG) has announced the opening of an advanced R&D center in the Raleigh/Durham (N.C.) Research Triangle.

The company is also exploring manufacturing site locations in North Carolina and other states in line with long-range expansion plans, according to Edson deCastro, president.

The R&D center will initially be devoted to advanced software development activities. A team of less than 10 software development people will be transferred in the near future from the Massachusetts area.

"The Research Triangle area appears ideally suited to such an effort in terms of working and cultural environment, business costs and advanced education institutions and the availability of talented people," deCastro said.

Adapso Unit, Cbema Testify

Industry Groups Condemn Reform Act

By Toni Wiseman
Of the CW Staff

WASHINGTON, D.C. – The Remote Processing Services Section (RPSS) of the Association of Data Processing Service Organizations (Adapso) submitted testimony to the House Subcommittee on Communications opposing the proposed Consumer Communications Reform Act of 1976.

The Computer and Business Equipment Manufacturers Association (Cbema) also presented testimony opposing the Bell-fostered legislation.

The RPSS supports the broadest availability of various types of carrier offerings, with the greatest freedom to innovate, experiment and develop interstate computer communications systems, according to D. Curtis DeForest, president of Calldata Systems, Inc., who represented the Adapso unit.

This, he said, applies both to the availability of carrier offerings and to the ability to interconnect either customer-provided or carrier-provided equipment.

The benefits of competition have been threefold, DeForest said.

"First, competition in the provision of computer communications equipment has encouraged the development of increasingly sophisticated devices which enable more efficient and less costly data transmission.

"Second, competition in the provision of certain common carrier services has led to the development of the innovative data transmission service offerings which are now available from specialized common carriers.

"Third, competition has encouraged the telephone company to upgrade many of its services and to introduce new services and equipment offerings which it did not previously have."

The spread of remote service utilization fostered the growth, if not the birth, of a manufacturing industry to supply the necessary equipment not available from the telephone company, he stated. It also fostered the growth of specialized common carriers to provide transmission services not available from regular carriers.

"The fact that such equipment and specialized transmission services were not available from organizations like AT&T appeared to be attributable to the inability of the well-established, very stable common carrier industry to understand the needs of the remote access data processing industry even though these needs were, in large part, capable of being satisfied by making use of the telephone system for something for which it had not originally been designed," DeForest said.

Recent legislative efforts to confer interconnection standards jurisdiction on the states are "both irrational, since there is an integrated nationwide system, and dangerous to our economy."

Presenting testimony on behalf of Cbema, President Peter F. McCloskey reemphasized his association's opposition to the Reform Act [CW, July 26].

"In basic terms, Cbema opposes the [Reform Act] because [its] strong anticompetitive thrust would, in our view, ill serve the interests of the American public," he said.

On the issue of whether the Federal Communications Commission (FCC) or individual states should formulate interconnection standards, McCloskey noted users who have nationwide operations require a uniform policy so they can use similar equipment in all the states to which their network extends.

A requirement that equipment be built to different standards for different states – or a situation in which some states would permit use of certain equipment with the telephone network and others would not – is fundamentally detrimental to full market development,

(Continued on Page 42)

Amdahl, Fujitsu in Joint Venture To Attack Overseas CPU Market

By Esther Surden
Of the CW Staff

SUNNYVALE, Calif. – Amdahl Corp. is entering into a joint venture with Fujitsu Ltd. of Japan to assemble, market and service Amdahl 470V/6 mainframes first in Europe and later in other areas of the world, Dr. Gene M. Amdahl told a group of security analysts here recently.

In addition, the group was told that Amdahl Corp. has negotiated an agreement with Western Electric and that it hopes to offer an IBM-competitive four-year lease plan.

Amdahl International Ltd. will be owned equally by both companies, Amdahl said. The company already has completed contract negotiations for three systems, two of which are to be installed by December.

The three users are in Germany and Norway, Amdahl added.

"Our biggest problem is being sure we can put in place in Europe the same level of support as we have in this country," he said. To this end, he added, the firm is "in the process of recruiting the proper executives."

Amdahl International plans to establish service and central maintenance facilities and a parts depot in Europe, he said.

The "balance of production capacity this year" has been reserved by customer letters of intent, according to Eugene R. White, Amdahl Corp.'s president.

The firm is shipping about three systems each month, White said. The number that can be shipped is dependent on the number that can get through the limited test facilities, he indicated.

The firm has shipped 15 systems this year, with eight of the systems delivered during the third quarter ended Sept. 24, he added.

The company also announced it has negotiated a general agreement with Western Electric under which Western may, but is not obligated to, buy mainframes from Amdahl.

Shipments to Western Electric, Pacific Northwest Bell Telephone Co. and AT&T Long Lines have already been made under the agreement, White noted, but he would not give the total number of systems involved.

The general health of Amdahl Corp. is good, according to Clifford Madden, vice-president of finance. A public offering in August, conversion of the company's convertible securities and earnings reduced the firm's debt from over $30 million to zero, he said, adding the company has not had to tap its line of credit with Bank of America, Security Pacific Bank and Crocker-National.

Amdahl hopes to arrange an IBM-competitive four-year lease plan for its users,

(Continued on Page 42)

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DG Gives Sweda Marketing Rights to POS System

By Toni Wiseman
Of the CW Staff

SOUTHBORO, Mass. – Data General. Corp. (DG) and Sweda International have reached an agreement which will give Sweda exclusive worldwide distribution rights to DG's supermarket system.

Under the terms of the agreement, which extends to 1980, Sweda plans to purchase $40 million in DG products. The agreement covers not only the purchase of the DG supermarket configuration, but also the purchase of minicomputers and peripherals to be used in other retail system configurations.

An industry observer noted this arrangement will greatly benefit the spread of DG's equipment since, to date, there is only one DG installation – at Brockton (Mass.) Public Markets, which helped develop the system.

Sweda, on the other hand, has a proven record of installations, as well as an implemented sales and marketing force for both the supermarket and retail industries, he said.

Sweda plans to combine features of the DG system and Sweda's own supermarket system to produce a complementary system, according to Emilio Fontana, Sweda's vice-president of marketing support.

The agreement covers two aspects, Fontana said. First, Sweda will become the distributor, in a sense, of the DG complete system; second, Sweda's Superscanner and its point-of-sale (POS) terminals will be integrated with the DG backroom equipment and software system.

Sweda initially will offer two systems, but will later consolidate and interface the Sweda terminals and scanner into the DG configuration, he said. Because both configurations already use a DG mini, there is a high degree of commonality between the two, he noted.

The agreement will result in Sweda's offering users a wider variety of configuration options since the two companies' designs and approaches differed.

DG's supermarket offering was totally systems-oriented; a user could not purchase a POS terminal without purchasing the entire system, he said.

Sweda, on the other hand, developed its terminal to have a high degree of stand-alone capability, Fontana said, adding it is in fact sold as a stand-alone to be upgraded later if the user desires.

In upgrades, Sweda has been using DG Novas, 1200s or Digital Computer Controls, Inc.'s DCC-116 as a controller.

As in the case of the terminals, scanners from both companies will be available to users, although Sweda plans to integrate its own scanner "because we believe that from an operational standpoint, from a retailing point of view, It has more benefits than the DG scanner," Fontana said.

He added, however, that the DG scanner has been proven in the two-year field installation at the Brockton Public Markets and will be offered as an alternative.

Amdahl: CCIA Has Far to Go

SUNNYVALE, Calif. – Although the Computer and Communications Industry Association (CCIA) has done a good job of acting as an information gatherer and disseminator and as a "conscience tweaker," the competitive environment has not improved much, according to Dr. Gene Amdahl, chairman of the CCIA and founder and chairman of Amdahl Corp.

"I wouldn't say the competitive situation itself has improved, except vendor awareness, to a certain extent, makes actions by dominant forces perhaps a little more circumspect just because they're aware of much greater concern and the much greater likelihood of observation," he said.

While the CCIA's efforts have resulted in some legislation and certain rulings being enacted, the association's actions have, to date, had very little direct effect, Amdahl said.

The CCIA is concerned with the realities of the competitive environment, namely "'Do we really have free competition or don't we?'

"Free competition isn't just a philosophy, it's something that has to be able to be executed in practice or it is meaningless," Amdahl said.

"So we are very much concerned about making sure free enterprise is in fact restored to the industry."

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Adapso Organizes to Fight New York Taxes

NEW YORK – Members of the Association of Data Processing Service Organizations (Adapso) have formed a New York State subcommittee of the group's Tax Committee to counter recently promulgated sales tax regulations on software and DP services.

A new set of New York state regulations, effective last Sept. 1, indicate software and various DP services such as time-sharing are taxable.

User Help Needed

In addition to canvassing software vendors for financial aid, the subcommittee is also soliciting help from users. It has scheduled a meeting here Nov. 15 to discuss plans, according to Dave Campbell, chairman of the subcommittee and vice-president of Computer Task Group (CTG) in Buffalo.

The formation of the subcommittee is one of several efforts by Adapso to help its members cope with various state tax laws, according to Jerry Dreyer, executive vice-president.

Legal Counsel

The association has retained Roberts & Holland, a New York City law firm, to advise it on various tax issues and to act as a resource for its members.

The subcommittee will work with the firm in preparing a position paper similar to that of an amicus curiae brief if CTG goes to court to fight taxation, both retroactive and prospective, on various parts of its sales and services.

Alan Rievman, chairman of Adapso's tax committee and vice-president of National CSS, Inc., acknowledged the effort will cost money and time.

The alternative, however, is to "wait until you have your own battle, but you'll have a decision in the CTG case to act as a precedent," he said.

If a strong case is not made for CTG, the precedent could be damaging to other members, he warned.

Sandy Goldberg of Roberts & Holland recommended vendors begin collecting sales taxes. By doing so they are not condoning the regulations, but merely protecting themselves, he said.

Membership

Among those volunteering for membership on the subcommittee were Campbell; Al Steinhart, president of CRC; Jack Loewenthal, controller of Applied Computer Techniques; A. Werner Pleus, general counsel of Calldata Systems, Inc.; and Robert Singer, corporate attorney of Automatic Data Processing, Inc.

Adapso Unit, Cbema Oppose Reform Act

(Continued from Page 40)

he stated.

"It is therefore critical that there be a continuance of the established national policy in these areas," McCloskey said. "This can be maintained only if the FCC continues to have the authority to prescribe the basic technical and related criteria."

Competition in the terminal industry must not be stifled, McCloskey emphasized, adding submissions from the FCC and other sources "show the threat of significant increases in residential rates because the use of competitive customer-premise equipment is without warrant.

"It becomes clear there is no need for Congress to help kill or cripple the competitive terminal equipment markets on the mistaken theory this will protect the residential user of telephone service," he said.

"The plain fact is that carriers supporting the [Reform Act] are not satisfied with a large percentage of the projected terminal equipment growth.

"They want more, even if this means crippling existing, working competitive markets – and they think they come closer to this objective through transferring regulatory authority over terminal equipment to the states," he stated.

Amdahl, Fujitsu Plan Joint Venture Abroad

(Continued from Page 40)

White said, but has no plans to offer monthly rental agreements. Amdahl systems are presently purchase-only with third-party leasing available, he added.

With a sufficient number of systems out in the field at present, the company is discontinuing its practice of shipping "100% spares with each shipment," White said, and instead is setting up depot centers for spare parts.

The average availability of systems "is running at 99%," he claimed.

"We have just announced a wholly owned subsidiary in Canada," he added.

In general remarks before the group, Amdahl noted his firm is dedicated to the large system user. "That large user has the largest investment, has the greatest variety of need and thus the largest trauma."

In the process of building its DP staff, the large user has developed the expertise to be able to consider companies other than IBM, Amdahl said.

The recent introduction of the Itel Corp. Advanced Systems [CW, Oct. 18] will have little or no impact on the Amdahl marketplace since the Amdahl mainframe is a more powerful machine, White said.

"We believe some customers will have problems when they look at the residual value of that machine," he told the group. "However, we welcome them into the industry."

The difference between Amdahl and Itel is that "Amdahl started as a total computer company" while Itel is a marketing and leasing organization, White said.

"We do provide total support," he noted, adding the Itel machine uses technology that has been around for a little while but "our technology has yet to be introduced by any others."

"We see acceptance of our product growing greater and greater," Amdahl said, but "we have to control our appetite because we don't want the company to grow except by the acquisition of highly qualified people."

The company is also working on improvements and further products "in terms of a major leap forward" in technology, Amdahl said, and on ways to provide users with additional functions without the need for additional applications software costs.

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Healthy Signs in First Quarter

Pertec Expecting Good Year After CMC Buy

By Toni Wiseman
Of the CW Staff

CHATSWORTH, Calif. – "Pertec is looking for a relatively good year this year in spite of what the outside world might have thought after the CMC acquisition," according to James R. Grimm, the firm's senior vice-president of finance and administration.

"This reflects the fact that we have quickly turned around a company our size, which had a shaky financial history," he added, noting the first quarter showed healthy signs.

For the quarter ended June 25, Pertec had revenues of $21.2 million compared with $13.4 million in the year-ago period. Earnings totaled $827,000 or 17 cents a share compared with $956,000 or 31 cents for the 1975 quarter.

In terms of overall direction from a financial point of view, Pertec's basic lines are solidly in place, Grimm said. "The firm has sufficient funding to look out into the future, with no amortization of debt until September 1979," he noted.

The acquisition of Icom gave Pertec a new marketplace, "one which we believe has unfathomable growth potential at this time," he said, and the company plans to continue development of its tape and disk lines.

The Business Systems Division (BSD) will soon be announcing new product lines, followed by add-ons to help keep Pertec in the forefront of the data entry market, he said.

"The growth in the market will come from current base expansion and the possibility of new acquisitions," he added.

Not Concerned With Share

Pertec's sales mix is currently a little over 30% from BSD, a little more than 40% from peripherals and about 20% from CMC, a ratio Grimm does not expect to change significantly, if at all, this year.

Pertec is not concerned with market share, Grimm said. "We build a good quality product first and make a reasonable return second, so market share takes a back seat.

"We're stronger than we were one year ago and will continue to grow because we reach the end user now. We cover the business from beginning to end," he stated.

"If we maintain our share in the tape market, we will continue to be a dominant force in that area. We could improve our market share, but gaining market share costs something, often profitability as a percentage of revenues," he said.

Pertec's long-range plans are to overlap the markets it currently serves with one another to take full advantage of its product lines, he said.

"I don't see any major shift in our thrust in the marketplace. Concepts are changing and we will grow in relation to them," he said.

Non-Calculator Business Growth Credited With Wang Expansion

LOWELL, Mass. – Wang Laboratories, Inc. was bursting at the seams until it gained an additional 270,000 square feet by moving its corporate headquarters here recently.

And additional expansion may come soon if the company's current growth rate continues. Wang's computer revenues have leaped from zero to $77 million in the four years since shipments of its 2200 small computer began.

This year – Wang's 25th anniversary in business – has been the best so far; its revenue rate, order rate and the value of its manufactured products each topped $100 million for the first time, according to Dr. An Wang, company founder and president.

Fueling that growth is a major product development effort in processors and peripherals and in word-processing systems, he said.

In March, the company introduced nine computer products, including a system to compete with IBM's 5100; a printer for OEMs as well as end users; a drum plotter; turnkey systems packages for the public accounting and auto parts markets; and a multiprocessor configuration at the high end of the computer line which positioned Wang to compete in the intelligent terminal and distributed processing systems markets.

Three months later, Wang followed with three CRT-based word-processing systems and, in September, the company unwrapped its 2200 VP processor, approximately eight times faster than its predecessor.

Wang is "confident" about his company's future as it enters its second quarter century.

"I am confident for several reasons," he said. "First, there is a growing awareness among computer users that we are now a major supplier of small business computer systems – and no longer only a maker of scientific programmable calculators. Our calculator business accounts now for only about 5% of our revenues.

"Second, applications for small computers are growing in several areas: in word processing and in distributed processing, by 'first-time' customers who are new to the computer industry and for many problem-solving applications, both in the laboratory and in the office."

Noting the 2200 line is sold in each of those markets, Wang said the word-processing series has been very successful since its introduction.

Distributed processing is growing in significance at Wang, he added, and sales are expected to account for nearly 20% of total revenues by the end of its year.

"Our systems and products are being used in three general applications areas in distributed processing – remote batch, remote processing and the upgrading of time-sharing installations," Wang said.

"While our distributed processing customers tend to be the medium to larger sized companies, we are continuing to sell to first-time users and smaller firms as well," he added, "so our large disk-based systems, our diskette systems and our smaller problem-solving systems have all done well.

"In the quarter just ended, all three were over 100% of goal. The large systems finished the quarter close to 200% ahead of their goal."

The 2200 VP should make the high end of the firm's computer line even more competitive, Wang said. "The faster processor allows us to keep ahead of rising user demands for higher speeds and better total performance – and do so without obsoleting any of our other products."

Wang declined to predict revenues or earnings for fiscal 1977, but said "we will be concentrating on additional development in 1977 for both our processors and our peripherals and will be adding interfaces, software packages and other enhancements to our computer product line."

Contracts

Control Data Corp. has received an additional $5 million contract from System Industries, Inc. for storage module drives.

Interdata of Canada, Ltd. has been awarded a contract valued at over $1 million by Systemhouse Ltd. for Model 7/32 computer systems.

Technicon Medical Information Systems Corp. has been awarded a contract by the University of Colorado Medical Center to install and manage a patient information system.

Technicon Medical Information Systems Corp. has been awarded a contract by Methodist Hospital of Indiana to install and manage a medical information system. The award is valued at $5.6 million.

Control Data Corp. has received a $2.3 million contract from the U.S. Army Electronics Command for Phase II of a competitive program to produce a large-scale Interactive Computer Presentation Panel.

Beehive Medical Electronics, Inc. has been awarded a contract to provide Scandia Metric with B100 video display terminals.

AIL, a division of Cutler-Hammer, has received a contract to furnish the Air Force Systems Command with a Programmable Indicator Data Processor system. The contract is valued at over $15 million.

Systems Engineering Laboratories, Inc. has been awarded a contract by Systems Development Corp. for SEL 32/55 computers. The systems are for use under a 34-month contract with the National Oceanic and Atmospheric Administration in development of the ground system for Tiros-N, an advanced weather satellite.

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UK Communications Show Set

LONDON – A Data Communications Equipment Exhibition will be held at the U.S. Trade Center here Jan. 10-14 by the U.S. Department of Commerce.

The UK data communications market, presently estimated at $150 million, is expected to reach $175 million by 1980, according to department figures. Imports presently account for over 90% of domestic consumption with the U.S. share at over half.

The exhibition will emphasize computer peripheral controllers and interface devices, combination I/O devices and processors, input equipment, output devices and parts and accessories of data communications systems.

Further information is available from the Department of Commerce, OIM United Kingdom, Washington, D.C. 20230.

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Australians Looking Overseas As Need for DP Workers Booms

SYDNEY, Australia – The demand for computer staff is booming in Australia and wages have soared to levels rivaling those of the U.S., according to *Computer Weekly*, an Australian publication.

This situation is good news for programmers and systems analysts, but is causing grave concern to employers, it noted.

"The potential demand for computing specialists will be five or six times the supply. Growth of personnel in the DP area is remarkable," *Computer Weekly* quoted a DP publication as saying.

"There are now about 11,000 full-time systems and programming staff employed in Australia and, over the next three years, a further 8,200 will be needed."

Because of this demand and the fact that the Australian government has now placed programmers and systems analysts with five or more years of experience in the "national need" category for immigration purposes, Australian employers are looking overseas to hire, *Computer Weekly* noted.

One personnel company, however, found Australian employers prefer DPers from Britain and Ireland "because they fit into [Australia's] lifestyle more readily than do their counterparts from other parts of the world."

Further information on job opportunities is available from American Australian Executive Placement Pty. Ltd., GPO Box 1886, Sydney, NSW 2001, Australia; and Computer Sciences of Australia Pty. Ltd., 460 Pacific Highway, St. Leonards, NSW 2065, Australia.

Questions on immigration requirements should be referred to the Australian embassy in Washington, D.C.

International News

Saudis Plan National Conference

By Peter Fingar
Special to Computerworld

JEDDAH, Saudi Arabia – A third National Computer Conference for the Kingdom of Saudi Arabia is scheduled for Feb. 22-24, 1977 here. The primary objective of the conference is the formation of the Royal Society for Computers and Information Processing (RSCIP).

Although much of this year's conference will be devoted to the formation of the RSCIP, the official theme is "Computers and Development in Saudi Arabia."

Papers are invited on (but not limited to) the topics of manpower selection and development, standards for information processing, guidelines for selecting hardware and software, DP installation planning, Arabic data representation and computers in a manpowershort economy.

Abstracts no longer than one page should be sent to Dr. Amin Kurdi, coordinator, Third National Computer Conference, King Abdulaziz University, Jeddah, Saudi Arabia.

Papers may be written in Arabic or English.

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Each of our seminar leaders is a highly accomplished and respected specialist in his field, and the effectiveness of the techniques they impart has been proven in installations all around the country. These seminars are geared for practical application at your installation, and they'll give you the dollars and sense knowledge you'll need to implement them efficiently. Workshops are an important feature of the seminars, and you'll gain practical mastery of the techniques under study as you exchange ideas and information with the seminar leader and with your peers.

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Led by Jack Stone, PhD, this two-day seminar will help you improve the usefulness and productivity of your computer operations by increasing your ability to communicate with people — from keypunch operators to the board of directors. Utilizing workshops, case studies and round table discussions, major topics covered include: Challenges and pitfalls of EDP people problems; principles of industrial relations in industry; managing analysts, programmers and operators; managing DP managers and supervisors; computer center end user and top executive relations, and the training, education and development of EDP personnel.

Cost for the seminar, including continental breakfasts and luncheons and all course materials is **$295** for the first registrant, and **$260** for additional registrants from the same company.

NEW YORK ... **Hilton** ... *Nov. 8-9*

Legal Tools For Computer Contracting and Protection

Led by Roy N. Freed, the internationally known lawyer, author and educator in the field of computer law, this 2½-day seminar will show you how to protect your interests when dealing with vendors that supply your installation. The seminar covers all types of contracts impacting computer use — including your own contracts. Other subject areas include negotiations, warranties, avoidance and resolution of disputes, security, fraud, taxation, and techniques for handling any transaction.

Cost for the seminar, including continental breakfasts, luncheons, and all course materials is $325 for the first registrant, and $275 for additional registrants from the same company.

CHICAGO .... **Hyatt Regency O'Hare** ... *Nov. 3-5*

Performance Evaluation and Improvement

Led by Saul Stimler, author of *Data Processing Systems: Their performance, evaluation, measurement and improvement*, this two-day seminar will give you performance measurement techniques that are *designed* to save your installation money. As well as system performance at your own installation, topics covered include: criteria for quantifying performance, pencil and paper analysis of a system, benchmarking techniques, realtime, batch, and interactive time sharing systems.

Cost for the seminar, including continental breakfasts and luncheons and all course materials is $250.

NEW YORK ... **Hilton** .... *Nov. 8-9*
CHICAGO .... **Marriott** ... *Nov. 15-16*

Data Communications Course #1010 — Practical Data Communications Systems & Concepts

Led by Dr. Dixon Doll, the nationally recognized teleprocessing consultant, this two-day seminar will familiarize you with the latest advances in data communications, with emphasis on ways to cut costs. The course covers areas like SDLC, HiD-LoD, DDS, newly approved major revisions to WATS, and the impact of satellite carriers.

Cost for the seminar, including workbook, reference materials, luncheons and continental breakfasts is $350 for the first registrant, and $300 for additional registrants from the same company.

New sites, dates

MIAMI .... **Miami Lakes Inn Country Club** ***Nov. 16-17***

Data Communications Course #1020 — Advanced Teleprocessing Systems & Design

Also led by Dr. Dixon Doll, this three day seminar, which is designed as a follow-up to course #1010, will show you techniques that minimize operating costs in commercial data communications networks. The course includes class study and discussion of your own systems, as well as procedures, approaches and algorithms for evaluating and cost-optimizing network operations.

Cost for the seminar, including an extensive set of customized course materials, continental breakfasts and luncheons, is $450 for the first registrant, and $400 for additional registrants from the same company.

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MAI Head Sees Minis Growing at Healthy Rate

MONTEREY, Calif. – Just as Americans in the 1960s wanted more horsepower under the hood, the small businessman of the 1970s wants more horsepower from his computer, according to Raymond P. Kurshan.

"We have seen this trend very clearly reflected in our own business," Kurshan, chairman and president of Management Assistance, Inc. (MAI), told a group of stock analysts here recently.

"Our earlier top of the line Basic/Four model could do eight tasks at once. The System 700 we recently introduced can handle 16 different jobs simultaneously and was developed to meet the rapidly growing computer sophistication of small businesses," he said.

Because of this demand for increased DP capability in small- to medium-size businesses, Kurshan predicted the minicomputer market will sustain a healthy growth rate for the foreseeable future.

"MAI's earnings have doubled in each of the last two years, and we see a high rate of growth reflected throughout the industry and holding firm through 1980," he said.

Greater Sophistication

"Interestingly, we've found the small businessman is in many ways more sophisticated than the Fortune 500 firms when it comes to minicomputers," Kurshan observed.

"They are more flexible and more adventuresome in exploring new applications," he said.

"Moreover, big organizations with huge DP centers are often locked into expensive equipment selected and operated by high-priced talent. Most small- to medium-size companies operate with the same – or even smaller – clerical staffs than they had before computerizing.

"And we have found these people will experiment and devise new uses for the equipment because they are not bound by rigid rules and regulations," he said.

Big Users and Minis

In addition to this interest of smaller companies, many larger companies are now devoting attention to the use of small business computers for two primary reasons, according to Kurshan.

The first is a trend toward decentralization, he said. In a company with a number of branches, for example, each manager could have his own computer terminal, making it possible to get information from the computer tailored to his specific needs.

The second is the real-time, on-line function of minicomputers, he said.

In addition to the demand from both small and large firms for increased capability, Kurshan contended the small business system industry will thrive because the minicomputer is the foundation of the much talked about "office of the future."

"Only recently has the business community started to address itself to the problem of what it really costs to operate an office – how much its costs to handle a letter from beginning to end, data storage and retrieval, etc.

"And with postal rates skyrocketing, being able to communicate quickly and inexpensively is becoming critical for many companies," he said.

In explaining the office of the future, he said it would combine data processing, word processing and facsimile transmission in one efficient, low-cost network with the minicomputer system as the hub.

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N.E. bank has immed opening for axpd mgr of trust systems. You will be resp for all short/long range planning. Min 5 yrs EDP/Banking exp req'd. Salary to $30,000 (fee paid). Contact Stan Durbas (in confidence).

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Technical Support Specialist

New position just opened for the data systems support "Pro".

To qualify, you must be able to provide: Hardware/software technical support in real-time, on-line communications oriented systems. "Hands-on" experience with minicomputers, integration of hardware and equipment operations. Designing, evaluation, implementation and maintenence of data communications software, evaluation, selection and installation of computer hardware.

If you want to be considered for this position, send your resume, with background, and salary history, in confidence, to:

Al Jordan
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MANAGER-INFORMATION SYSTEMS

A well established, Chicago-area based, manufacturar of metal industrial products has a challenging opportunity for an individual with 2-3 years systems analyst background and several years of EDP managerial experience. The candidate will report directly to the President.

Must be skilled in systems evaluetion, design and installation in a manufacturing environment. Knowledge of long and short range EDP planning including economic feasibility required.

This challenging position will provide the opportunity for personal growth and commensurate compensation. Please reply in confidence to:

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Responsible for leadership of complex computer project development within specifications of project schedules. Coordinates User Department project management, personnel, education and communication to provide successful installation. Designs, organizes and analizes systems specifications to insure timely and accurate implementation. Recommends and conducts studies to assist management and User Department in determining the impact of new programs and tha utilization of resources. Assist the Manager of Systems and Programming in developing formal presentation, proposals and written reports. Designs, codes, implements and maintains support systems.

Xerox Sigma =GE systems. Bachelor's degree preferred. Seven years minimum data processing experience which includes three years programming in a compile level language and two years systems analysis. Must have knowledge of payroll A/R & A/P Programs. $18,528 plus excellent fringe benefits. Send resume to: **Wayna County Community College**, Personnel Office, Room 303, 4612 Woodward, Detroit 48201. *Equal Opportunity Affirmative Action Employer M/F.*

EDP OPPORTUNITIES

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SYS III MOD 10/12 RPG II mgr, NYC 50% proj, 50% admin. $17-20M
SYST ANAL-prodn control R/T on-line interactive environment, deg req $19-23M
PROG ANAL-learn T-CAM-min. 2 yrs BAL/OS reqd. $17-21M
AUDITOR-Fincl-EDP acctg deg, Big 8, 50% nat'l travel. $19-21.5M
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PROGRAMMERS TO $18K Large IBM 370/OS/VS/COBOL installation. Experience in any of the following: IMS; CICS; TOTAL; ON-LINE.

If you are sincerely interested in pursuing a career in Pittsburgh, send resume (including salary history) to RON PEARCE.

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SYSTEMS

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17-20K

Information system for a publicly fundad college in Manhattan requires project leader with 3-4 years of OS experience. You will have complete responsibility for implementing a student system. Experianca in working with usars and programmers, and writing system specifications essential. Degree required. Excellent fringe benefits and good working environment. One year appointment, with strong possibility of renewal. Send resume to CW Box 4807, 797 Washington St., Newton, Mass. 02160.

SENIOR SYSTEMS ANALYST

The office of Management Information and Computing is seeking a Senior Systems Analyst with B.A. or equivalent in math or business related field. Applicants must have at least five years of D.P. experianca, three as a Systams Analyst. Experience in COBOL and IBM/DOS required. Applicants with experience in higher education applications, on-line systems and DBMS praferred. Candidata hired will be involved in development of applications under our integrated database. We offer an excellent benefits package. Salary commansurate with qualifications. Send rasume and references no later than Novamber 29th to Box 240, Waterman Building, University of Vermont, Burlington, Varmont 05401.

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Software Development Engineering

San Francisco Peninsula

Our Software Engineering Department is continuing to grow. Professionals who join us will help expand the state-of-the-art in such areas as MULTI-PROCESSING, MULTI-COMPUTER NETTING, DATA MANAGEMENT, SIGNAL PROCESSING, OPERATING SYSTEMS and REAL-TIME SOFTWARE SYSTEMS.

Currently we have several openings in the following areas:

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Extensive storage and retrieval from large multi-user technical data base. Requires 1-5 years' experience in detailed design and implementation.

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Requires 3-10 years' experience in test plan development, execution and acceptance testing to systems specs.

COMMUNICATION SOFTWARE

Senior level with Univac, UYK-7 experience.

SUPPORT SOFTWARE

Diagnostic support software and general software development. Requires 2-10 years' experience.

SOFTWARE TECHNICAL & PROJECT MANAGEMENT

5-10 years' experience performing softwara systems engineering or task management of 10-30 man real-time intelligence system softwere development projects.

For confidential consideration, please submit your resume including salary history/requirements to Dept. CW 287, P.O. Box 188, Mt. View, CA 94042. An equal opportunity employer, minorities and females encouraged to apply. U.S. citizenship required.

GTE SYLVANIA

Massachusetts Institute of Technology

Faculty Position in Computer Aided Design

A new faculty position in Computer Aided Design has been created within The Department of Architecture. Candidates for this opening are invited to submit their resumes and any additional information by December 31, 1976 to:

Professor John Habraken, Head
Department of Architecture
Massachusetts Institute
of Technology
77 Massachusetts Ave.
Cambridge, Massachusetts 02139

The position includes 50% research and 50% teaching. The latter entails:

1) An introductory design methods subject at the graduate level, but available to undergraduates.
2) A graduate seminar centered on the candidate's expertise
3) Ph.D. and M.S. Thesis supervision.

Prerequisites include:

1) Ph.D. equivalent in Computer Science
2) Professional degree or experience in design:
    a) art
    b) architecture
    c) graphics or
    d) planning
3) Experience teaching at the college level
4) Demonstrated ability and interest in research.

The position can be at either the Assistant or Associate Professor level; salary to be negotiated.

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If you have two or more years experience in microprogramming, the New England region offers tremendous career potential. With over 50 micro and mini manufacturers located in this area there is growing demand for individuals with a strong understanding of micro coding.

Openings exist within easy reach of the Cape Cod beaches and the ski slopes of New Hampshire.

Inquiries are invited from applicants at all levels and will be treated confidentially.

Call or send resume with salary information to:

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East: Boston (617/237-3120), New York-New Jersey (201/687-8700), Philadelphia (215/665-1717), Washington, D.C. (703/790-5610).
Midwest: Chicago (312/782-0857), Cleveland (216/771-2070), Detroit (313/352-6520), Kansas City (816/474-3393), Minneapolis (612/544-3600), St. Louis (314/862-3800).
South & Southwest: Atlanta (404/325-8370), Dallas (214/638-4080), Fort Worth (817/338-9300), Houston (713/626-8705), New Orleans (504/561-6000).
West Coast: Los Angeles (213/388-5500), Irvine, CA (714/833-1730), Palo Alto (415/328-7155), San Francisco (415/434-2410).

SENIOR SYSTEMS ANALYST

Dresser Industries, Inc., a worldwide company of highly engineered products and services, has an opportunity for an individual with strong proven analytical skills with its Central Louisiana Operation.

Responsibility will include the formulation and integration of manufacturing, financial and marketing systems concepts.

The analyst should have five years experience involving real time systems using OS, HASP, COBOL, CFMS or INTERCOM.

Forward resumes in confidence to W.E. Wyatt, Dresser Industries, Inc., Box 1430, Alexandria, LA 71301.

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CALIFORNIA STATE UNIVERSITY

CSU-Fresno has an immediate opening in a challenging university environment for a creative individual to fill the following position (prefer applicants with higher education experience).

COORDINATOR OF USER SERVICES

Incumbent will head center's operation position which operates on a 24/7 day basis and includes 14 persons and two computer systems. As a member of the management team responsibilities will include user access to services, accounting and usage records, statistics and studies. Coordination with other center division and various other administrative functions. College degree plus two years professional experience in a computer center preferably in a supervisory capacity.

Salary range $14,700-$17,688. The center serves the instructional research and administrative computing needs of a 15,000 student campus. Metropolitan area of Fresno is approximately half million population with easy access to S.F., L.A., and Yosemite and Sequoia National Parks.

Apply before November 15, 1976 to Personnel Office, California State University, Fresno, Calif. 93740 (209) 487-2032.

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Programmers & Programmer/Analysts

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Applicants should have 1-6 years experience and have a background in the following:

IBM 360/D.O.S.
D.B.O.M.P./B.O.M.P.
C.I.C.S. or other T./P. Experience
Assembler Language
Cobol

Resumes must include salary history and salary requirements.

E-SYSTEMS INC.
Memcor Division
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Data Processing Careers, Inc
Suite 1109
Stemmons Tower West
Dallas, Texas 75207
DETROIT
Electronic Systems Personnel
1705 Fisher Building
Detroit, Michigan 48202
FLORIDA
Data Sciences Personnel, Inc
Suite 205
15490 N. W. 7th Avenue
Miami, Florida 33169
HARTFORD
Compass, Inc
900 Asylum Avenue
Hartford, Connecticut 06105

LOS ANGELES
TeCS, Inc
3440 Wilshire Boulevard
Suite 1007
Los Angeles, California 90010
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801 Nicollet Mall, Suite 1716
Minneapolis, Minnesota 55402
NEW YORK
Botal Associates, Inc
405 Lexington Avenue
New York, New York 10017
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TaskForce, Inc.
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1046 E. Wendover Ave.
[illegible]
Greensboro, North Carolina 27405
PITTSBURGH
Electronic Systems Personnel
108 Lawyers Building
428 Forbes Avenue
Pittsburgh, Pennsylvania 15219

PROVIDENCE
Xavier Associates, Inc.
10 Dorrance Street
Providence, Rhode Island 02903
SAN FRANCISCO
The Computer Resources Group Agency, Inc.
303 Sacramento Street
San Francisco, California 94111
SYRACUSE
EFA Associates Personnel, Inc. (Agency)
2530 James Street
Syracuse, New York 13208
TULSA
Data Processing Careers, Inc.
Suite 10, Park 21 Building
2828 East 21st Street
Tulsa, Oklahoma 74114
WASHINGTON, D.C.
ESP Systems Corporation
Suite 210
1211 Connecticut Avenue N.W.
Washington, D.C. 20036

FLORIDA INTERNATIONAL UNIVERSITY

Computer Research Specialist (Systems Programmer)
S.E. Regional Data Center
$13,904-$17,304 Annually

Seeking qualified computing professional to provide systems support and development on a Univac 1106. Install and maintain all major system software including telecommunications packages, compilers, processors, utilities, and operating systems. Analyze changes and enhancements to vendor supplied software in relation to data center requirements.

Masters Degree in relevant field plus some systems programming experience, preferably in an academic environment. Please send resume and salary history to Mr. James Helm, Director, Serdac, Florida International University, Tamiami Trail, Miami, Florida 33199.

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SYSTEMS PROGRAMMER

Technically proficient software analyst needed to handle systems maintenance, generation, and application support. Exp. must include OS internals, CICS or IMS helpful. Communications a plus. Degree. $21,000 (fee paid). Contact P. Stegal:

ROBERT HALF PERSONNEL AGENCIES
1310 Liberty Bank Bldg.
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(716) 842-0801

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A French company is looking for a computer analyst with 3-5 years in telephone switching. Initial training period of six months in France followed by permanent location in the U.S. French language skills highly desirable. Respond to

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EDP Mgr . . . . $24-$28K
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IMS Analyst . . . . $15-$22K
CICS Analyst . . . . $15-$20K
Software Programmers VS, OS, DOS . . . . $15-$23K
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Don't wait another day . . . find out what you are really worth, send your resume or call today:

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of Youngstown
25 E. Boardman St., Suite 400
Youngstown, Ohio 44503
(216) 744-4361

Our Clients pay all Fees (Interview, Relocation, and Agency Fee.) Reply in strict confidence.

Communications Technician
Cook Industries

Cook Industries, a Memphis based Fortune 500 company, is seeking an individual interested in a career in communications. The candidate chosen will have a knowledge of fundamental electronics and experience as a computer field engineer or as a maintenance engineer with a communications company. Duties will include maintenance of an in-house corporate telecommunication network. The network consists of computer based voice switching, message switching and digital voice processing systems. Responsibilities will be primarily maintenance related with limited administrative duties. Occasional travel will be necessary. We offer a competitive salary, a complete fringe benfit package and excellent advamcement opportunity.

Please send resume detailing experience and salary requirements to:

Employment Manager
COOK INDUSTRIES
P.O. Box 16902
Memphis, TN 38116
Equal Opportunity Employer M/F

ASSOCIATE PROGRAMMER

Dynamic Data Services firm providing a management service to the health care industry nationwide has a challenging opportunity for an experienced programmer.

This position requires a minimum of two years experience using COBOL with BAL and RPG knowledge helpful but not required. You must be a self-starter able to work independent of direction and aspire to future management opportunities.

If you meet the minimum requirements and are looking for opportunities for rapid growth financially, educationally, with company advancement and without the traditional fear of layoffs, then consider a career with Computer Consulting Service, Inc. of Dubuque, Iowa.

Send your confidential résume to:

Charles Mills
Personnel Manager
Computer Consulting
Service, Inc.
P.O. Box 1278
Dubuque, Iowa 52001

PROGRAMMER

(DL-1)

R.J. Reynolds Industries, Inc., has an opening on its Systems and Programming staff for a Data Processing Programmer. The position will report directly to a Systems Manager, R.J.R.I. Systems and Programming Department.

Applicants should possess the following:

- **Experience in DL-1 Data Base language.**
- **Experience in coding ANS Cobol language in the IBM 370/DOS/VS environment.**
- **Knowledge of the design, test, documentation, implementation, and maintenance of assigned programs.**
- **Familiarity with current available hardware and software technology.**
- **Undergraduate college degree preferable.**

Excellent benefits package, including paid relocation.
Send resume and salary requirements, in confidence, to:

Mr. Denis G. Simon
Corporate Employment Department
R.J. Reynolds Industries, Inc.
401 North Main Street
Winston-Salem, North Carolina 27102

RJR

EDP DIRECTOR

Exceptional growth company in the Southwestern United States seeks a high achieving EDP Director. The person must be creative, highly competent technically, and a good people manager.

The right person will have a good understanding of the retail industry and will be able to relate to the needs of the user. Operations experience coupled with strong IBM systems and programming management ability are required for this profitable, successful company.

If you believe yourself qualified, please send resume and present salary in confidence to:

Rob Brooks
PROFESSIONALS FOR COMPUTING
Carillon Tower East, Suite 613
Dallas, Texas 75240
Executive Search Consultants

DATA PROCESSING DIRECTOR

CAREER POSITION WITH PIMA COUNTY GOVERNMENT located in sunny Tucson, Arizona. Monthly salary range is $1,743 to $2,225. Successful candidate will be responsible for administrative work of unusual difficulty in planning, organizing, developing, and coordinating the overall activities of the Data Processing Department. Minimum qualifications: Any combination of training, education, and experience which demonstrates ability to perform position duties preferably including a bachelor's degree in Computer Science, Business Administration, or acceptable field, and eight (8) years of progressively responsible training and experience including three (3) years of supervisory and managerial experience.

Arizona residency requirement waived for this position. Send resume to Pima County Personnel Department, Health and Welfare Building, 151 West Congress Street, Tucson, Arizona, 85701, no later than 5:00 P.M., November 12, 1976.

Pima County is an Equal Opportunity Employer M/F

SYSTEMS ANALYST

International Marketing Services

We are seeking a person to perform pre-sales activities in the health care market.

To qualify for this career opportunity, you would have 3-5 years experience with hospital systems. You would have a BS/Marketing or C/S or equivalent expertise in this field.

Your tasks in this position would be to participate in defining application programs and providing technical support to sales presentations and proposal formulation for health care systems.

To investigate this outstanding opportunity, send your resume to:

NCR

Mr. Vernon L. Mirre
Corporate Executive &
Professional Recruitment
NCR Corporation
Dayton, Ohio 45479

An Equal Opportunity Employer

PROGRAMMER/ANALYSTS

SYSTEMS ANALYSTS

Federated Department Stores, Inc., a national leader in retailing, has a major systems development program in progress utilizing advanced application concepts. This program offers ground floor opportunities for professionals in the following positions:

PROGRAMMER/ANALYSTS

- 3 or more years COBOL programming experience
- Experience in IMS DB/DC desirable but not essential
- Familiarity with Top-Down design and structured programming
- Demonstrated design level skills

SYSTEMS ANALYSTS

- Thorough and demonstrated expertise in one of the following:

Retail (preferably department store) Accounts Payable
Personnel/Payroll

- Contemporary systems design and analysis experience

Preferably including large systems efforts from startup to implementation

- Familiarity with HIPO and structured programming techniques

These positions offer excellent starting salaries and liberal benefits, with the opportunity to play a key role in a multidivision systems development effort, and can lead to further significant career growth.

To explore these exciting opportunities, send your resume including salary history to:

Mr. Frank McKain
Systems Research & Development
Room 504

Federated Department Stores, Inc.

222 W. Seventh Street
Cincinnati, Ohio 45202
All replies held in strict confidence
An Equal Opportunity Employer

Data Processing Professionals

Manufacturing Project Manager/Systems Analyst

Manages major information systems projects. Performs system design and analysis for commercial application. Consults with and provides information systems representation to user groups.

Requires a BS or equivalent professional experience and a minimum of 3 years experience in commercial systems design and analysis. Specific experience should include project management data base applications and manufacturing, production and inventory control systems. Entry salary range is between $15,000 and $21,000 based on qualifications.

Data Base Administration Analysts

These openings will support our 370/168 MVS, IMS, TP system. The position will administer the data processing and user groups in a TSO environment.

Responsibilities include tuning, debugging, and central block generation. Debugging will include application programs and IMS software. IMS data analysis and action recommendation is also needed.

Background must include training in file structures as well as design and administration of IMS Data Bases. A BS in Math, Computer Science or equivalent experience is desirable. Entry salary range is between $16,000 and $19,000 based on qualifications.

Tektronix, Inc., develops, manufactures and markets internationally recognized precision electronic measurement instruments, computer peripherals and related electronic instrumentation. Located near Portland, Oregon, we are within a two hour drive of the Cascade Mountains or Ocean Beaches. The close-by nature playgrounds and the city of Portland provide a variety of recreational and cultural interests.

Benefits include liberal insurance and retirement programs, educational support and profit sharing.

Please send resumes to: Roy Epperson, TEKTRONIX, INC., P.O. Box 500, C1, Beaverton, OR 97077.

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MANAGEMENT ANALYST

Substantial, successful, diversified food processing firm seeks a multi-skilled professional for its expanding management information/operations reseach department. Responsibilities will include developing business, research and statistically oriented systems. Qualifications should include a Masters Degree with at least two years of commercial system design experience. ANS COBOL programming experience is highly desirable. Our hardware is a 360/50 with 512K of memory and 16 spindles of disk running under DOS/R5. Position offers an attractive salary and the opportunity to develop meaningful and profitable data processing applications. Pleasant recreational mid-Atlantic location. For confidential consideration please forward your resume with salary history to:

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DATA PROCESSING PROFESSIONALS

A rapidly growing systems management company seeks experienced Data Processing Professionals for immediate assignment in Saudi Arabia.

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Minimum 5 to 7 years experience in applications programming in a teleprocessing environment on IBM 370 DOS systems. Must be fluent in COBOL and Assembly Language and possess knowledge of IBM's CICS and 3270 terminals.

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Minimum 5 to 7 years experience in systems maintenance end support for IBM OS/VS and CICS systems.

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Joe Pape
SYSOREX INTERNATIONAL INC.
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Palo Alto, Calif. 94304
(415) 493-4641

PROFESSIONAL D.P. CAREERS

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Programmer/Analyst: with 2-4 years business applications experience in IBM 360/370 OS MVT HASP TSO environment using COBOL or ASSEMBLER. System 2000 Data Bese Management, structured programming, and teleprocessing experience is highly desirable but not required.

These positions offer excellent salary combined with a comprehensive fringe benefit program and convenient surburban location. We offer professional career positions with opportunity for individual growth and development. For immediate consideration call collect (205) 956-8020 ext. 363 or write Perry W. Turner, Personnel Manager, P.O. Box 235, B'ham, Al. 35201. All information strictly confidential.

CARS

Since 1964 Computerized Automotive Reporting Service (CARS) end its data processing company Action Computer Technology (ACT) have established the industry's leading data processing operation which provides comprehensive accounting, inventory and leasing services to automotive dealerships throughout the U.S.

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EDP CAREER OPPORTUNITY

Want to join a progressive utility that gives you an opportunity for growth? Then, take a step up in your professional career . .

BUSINESS APPLICATIONS PROGRAMMER

Customer acct. project team. Must have at least 3 years experience COBOL on 370 DS. Degree required.

SYSTEMS PROGRAMMER

CICS. Presently running VS 2 REL 1 on 370/158 and 370/155-II with HASP, Shared-spool, CICS, CALL-VS, TSO, etc. Degree preferred.

EDP AUDITOR

1-5 years auditing experience. Degree required. Excellent salary and benefits. Send resume to:

M. FISHBURNE

CP&L

Carolina Power & Light Company
Department C, P.O. Box 1551
Raleigh, North Carolina 27602
An Equal Opportunity Employer M/F

The NCR Data Processing Center

has immediate openings for Programmer Analyst in the San Francisco Bay Area. If you have:

- Two or more years of college
- An interest in solving data processing problems
- An interest in serving people
- 2-3 years experience writing in the NEAT/3 language and/or COBOL
- Savings and Loan Experience (helpful but not required)

We would like to talk to you about:

- An opportunity to work with large scale real-time Systems
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If you are interested in making a sincere investment in your future, please contact Mr. Joseph W. Bono (415) 573-8700 or send resume to:

NCR Data Center
1153 Triton Drive
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Equal Opportunity Employer M/F

Ph.D. or actively enrolled in Ph.D. program, or M.S. with equivalent experience with knowledge of computer applications and operation research. Implement and coordinate college computing facility and serve as liaison to faculty. Teach courses in computer as related to business, science, and math. Experience to interface research projects and develop software for mini-computer desirable. $14,000 - 16,000, 10 mo.

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Quarter Results Also Rise

Honeywell Posts Gains in Nine Months

MINNEAPOLIS – Honeywell, Inc.'s third-quarter and nine-month results were improved over those in the year-ago periods.

Worldwide computer revenues, including those of CII-Honeywell Bull as well as rental and service revenues, were ahead of last year in both periods.

Purchase revenues in the quarter were higher than in 1975's comparable period and about equal to last year's nine-month level, the firm said.

Third-quarter net worldwide bookings in the computer area were substantially ahead of the same 1975 quarter and the second quarter of 1976, the firm said.

Bookings for the nine months also were ahead of those in 1975.

For the third quarter, Honeywell posted earnings of nearly $37 million or $1.70 a share, including a $1.4 million tax credit, compared with $30.8 million or $1.50 a share in the same period last year.

During the recent quarter the firm sustained a $190,000 loss in equity of nonconsolidated companies compared with an $11.7 million credit during the 1975 period that stemmed principally from foreign currency gains, the firm said..

In the same quarter, Honeywell received a $12 million gain from its sale of 19% of its equity in Honeywell Bull. There was no foreign currency gain in the recent quarter compared with $14.3 million in the year-ago period.

Revenues for the quarter totaled $641.4 million compared with $568.9 million in the same period last year.

Computer rental and service revenues rose to $130.8 million from $115.4 million in the year-ago period.

During the nine months, Honeywell's earnings rose to $69.9 million or $3.21 a share compared with $44.6 million or $1.94 a share in the same period last year.

Foreign currency gains during the nine months were $3.8 million in 1976 compared with $6.8 million in 1975.

Revenues rose to $1.8 billion compared with $1.7 billion in the year-ago period. Of these, computer rental and service revenues totaled $379.5 million compared with $343.6 million.

Revenues for 1975 have been restated to reflect the reduced interest by Honeywell in Honeywell Bull-CII. Honeywell's share of the French firm's earnings are now reported on an equity basis instead of on a consolidated basis.

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DG Earnings Climb 46% in Year As Revenues Show 49% Increase

SOUTHBORO, Mass. – Data General Corp.'s (DG) earnings for. fiscal 1976 jumped 46% while revenues rose 49% over its 1975 results.

Earnings for the year rose to $18.9 million or $1.98 a share compared with $12.8 million or $1.51 a share a year ago.

During the year, revenues climbed to $161.1 million, up from $108.2 million in 1975.

For the fourth quarter, earnings rose 62% to $6.8 million compared with $4.2 million in the year-ago quarter.

Revenues for the quarter rose to $58.4 million compared with $34.6 million in the 1975 fourth quarter.

Edson D. DeCastro, president, recently announced DG had reached a preliminary agreement for the acquisition of Digital Computer Controls, Inc. (DCC). The acquisition is valued at about $11.6 million.

The preliminary agreement calls for a maximum of 303,500 shares of DG common stock to be issued in exchange for shares of DCC. The exact number of DG shares will be determined by a formula based on the average market price of DG stock for a 20-day trading period prior to the effective date of the Registration Statement.

The DCC stock will be valued at $7.50 per share for purposes of the exchange, while the DG stock, in accordance with the proposed formula, is subject to a minimum valuation of $38.40 and a maximum valuation of $57.60 per share.

Depending on the valuation of DG's stock, this would result in an exchange ration of 5.12 shares of DCC for each share of DG or 7.68 shares of DCC for each of DG.

Amdahl Doubles Period Revenues

SUNNYVALE, Calif. – Amdahl Corp. turned in third-quarter earnings of $6.9 million on $26 million in revenues.

The earnings, which include a $3.3 million tax credit, comprise nearly 70% of the nine-month total of nearly $10 million, which included a $4.8 million tax credit.

Revenues for the quarter were nearly double those of the preceding second quarter and about equal to total revenues for the first two quarters, bringing the nine-month total to $52.3 million, the firm said.

In the third quarter, Amdahl installed eight of the 15 470V/6s it has delivered in 1976, according to President Eugene R. White. Amdahl recorded its first revenues in the 1975 fourth quarter.

MDS Results Dip in First Quarter

PARSIPPANY, N.J. – Mohawk Data Sciences Corp.'s (MDS) revenues and earnings both dropped in its first quarter.

The declines were attributed to reduced currency translation gains, rental base reductions resulting from conversion sale activity last year and lower OEM sales.

Earnings for the quarter were $1.4 million or 19 cents a share with translation gains of $3,000. Earnings for the year-ago quarter were $2.1 million or 31 cents a share when translation gains amounted to $1.8 million.

Revenues for the period totaled $38.9 million compared with $41.7 million in the year-ago period.

Discounting the currency gains, however, earnings rose slightly to $3.3 million from $2.2 million a year ago.

Acquisitions

Microdata Corp. has agreed in principle to acquire all outstanding shares of **Computer Technology, Inc.**, a manufacturer of matrix printers.

Insurance Systems of America has acquired all the assets of **Executive Management Software & Services, Inc.**, a marketing firm for multiline property and casualty systems.

Data Card Corp. has agreed to acquire **Rapid Data Systems (Holdings) Ltd.**, a UK company, for $1.4 million.

Baron Data Systems has acquired **Information Terminals Corp.'s Transcripts product line**, a computer-aided transcription system for use by court reporters.

Dictaphone Corp. has agreed to acquire all outstanding **Data Documents, Inc.** common stock for $2.1 million.

Applied Devices Corp. has acquired the balance of outstanding common stock from **Datatrol**, finalizing the merger of Datatrol as a wholly owned subsidiary. Under the terms of the agreement, .18519 share of Applied Devices common stock will be exchanged for each share of Datatrol common.

Tymshare, Inc. has completed arrangements for investment in **Sligos S.A.** and increased its interest in **Cegos-Tymshare.**

Tymshare purchased an 11% interest in Sligos for about $1.5 million and made a loan of about $1.5 million, which is convertible at Tymshare's option into an additional 9% equity in Cegos-Tymshare to 45% from 20% for about $1.1 million.

The **National Enterprise Board** (NEB) has taken a controlling interest in **Data Recording Instruments Co. Ltd.**, a British computer peripherals firm. The NEB now owns 53.93%.

Nickels & Dimes

Tektronix has raised its semiannual dividend 25% to 15 cents a share payable Nov. 1 to holders of record Oct. 4.

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Burroughs has declared a dividend of 17 cents a share payable Nov. 8 to holders of record Oct. 8.

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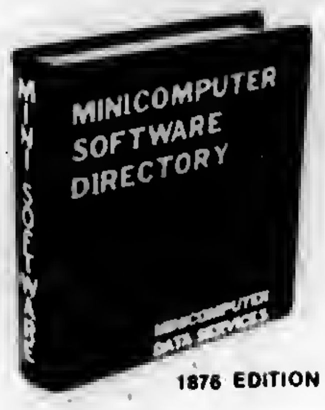

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Sealed proposals will be received by tha CDPA, 508 Robert E. Lae Bldg., Jackson, MS 39202, up until 2:00 p.m. 11-15-76 for the following data processing equipment:

Request for Proposal No. 262 for the purchase of an additional 32K words of memory for an existing PDP 11/70 computer system.

Request for Proposal No. 263 for the purchase of a Hewlett-Packard 2112A computer and related equipment.

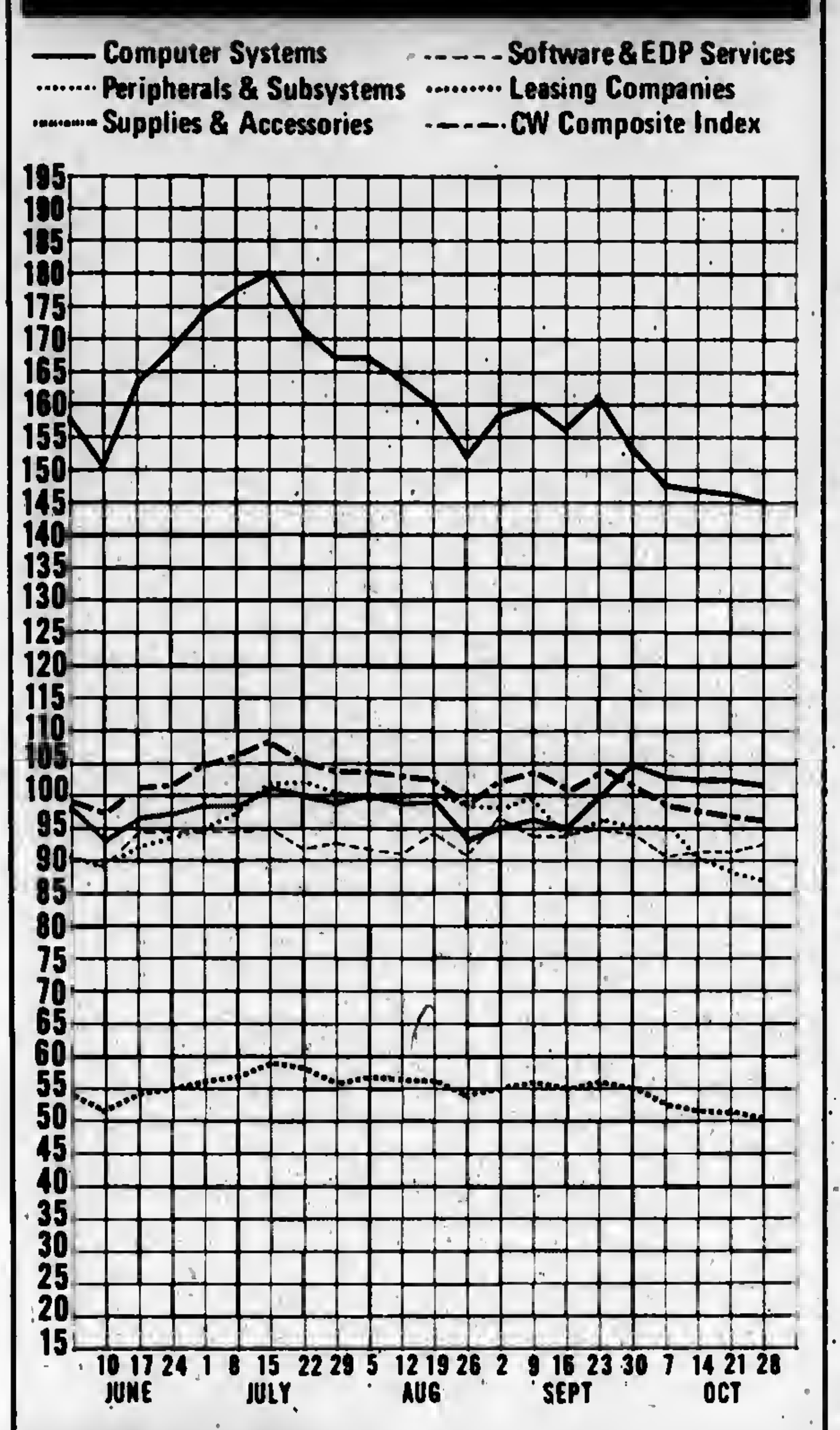
Request for Proposal No. 264 for the purchase of the service for the development, installation, and training of a data center backup and recovery disaster plan for the State of Mississippi.

Request for Proposal No. 265 for the purchase of 2 DEC model DC10B asynchronous communication port expanders to attach to an existing DEC 1077 computer system.

Request for Proposal No. 266 for the purchase of an opticel scanning device with EIA RS232C interface, capable of asynchronous communication with e DEC 1077 computer system..

Detailed specifications may be obtained from the CDPA office. Tha CDPA reserves the right to reject any and all bids and proposals and to waive informalities. Clyde P. Ballard, Executive Director, Central Data Processing Authority.

COMPUTERWORLD Computer Stocks Trading Indexes



Earnings Reports

TELEX

Three Months Ended June 30

	1976	1975
Shr Ernd	$.11	$.19
Revenue	24,602,000	27,508,000
Tax Cred	439,000	635,000
Earnings	1,138,000	1,972,000

TEXAS INSTRUMENTS

Three Months Ended June 30

	1976	1975
Shr Ernd	$.98	$.49
Revenue	392,198,000	330,961,000
Earnings	22,569,000	11,295,000
6 Mo Shr	1.91	1.10
Revenue	761,565,000	663,718,000
Earnings	43,856,000	25,287,000

TRW

Three Months Ended June 30

	1976 (000)	a1975 (000)
Shr Ernd	$1.03	$.84
Revenue	743,800	667,100
Earnings	37,800	28,900
6 Mo Shr	1.75	1.21
Revenue	1,466,300	1,275,900
Earnings	64,300	43,500

a-Restated.

VARIAN ASSOCIATES

Three Months Ended July 2

	1976	1975
Shr Ernd	$.33	$.31
Revenue	87,093,000	79,762,000
Earnings	2,394,800	2,139,000
9 Mo Shr	.86	.80
Revenue	251,210,000	229,364,000
Earnings	6,310,000	5,518,000

VICTOR COMPTOMETER

Three Months Ended June 30

	1976	a1975
Shr Ernd	$.32	.....
bRevenue	55,157,000	$51,482,000
Disc Op	102,000	125,000
Tax Cred	103,000	53,000
Earnings	d1,809,000	(457,000)
6 Mo Shr	.38	.....
bRevenue	103,371,000	94,841,000
Disc Op	175,000	141,000
Tax Cred	166,000	69,000
Earnings	d2,231,000	(2,462,000)

a-Restated to reflect a subsidiary's operations liquidated after sale of its assets on Aug. 31, 1976. b-From continuing operations. d-Includes $733,000 from sale of certain fixed assets.

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Computerworld Stock Trading Summary

CLOSING RRICES WEONESOAY, OCTCBER 27, 1976

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CCMPUTER SYSTEMS

EXCH		RRICE 1976 PANGE (1)	CLOSE OCT 27 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURPCUGHS CORR	84-108	91 7/8	+2 1/4	+2.5
O	COMPUTER AUTCMATICN	10- 19	14 3/4	- 1/4	-1.6
N	CCNTRCL OATA COPP	18- 27	29	- 3/8	-1.6
N	DATA GENEPAL CORP	40- 60	42 7/8	+2	+4.8
O	DATARDIN7 COPP	24- 46	27 3/4	+ 1/2	+1.8
O	OIGITAL COMP CCNTROL	2- 7	5 1/2	- 5/8	-10.2
N	OIGITAL EOUIPMENT	138-181	150 3/4	+5	+3.4
N	ELECTPONIC ASSOC.	2- 5	2 1/4	- 3/8	-14.2
A	ELECTPONIC ENGINEER.	7- 16	8 5/8	- 5/8	-6.7
N	FCKBOPO	28- 50	42 1/4	-2 1/4	-5.0
O	GENEPAL AUTCMATICN	4- 11	4 1/2	0	0.0
O	GPI CCMPUTER CORP	1- 1	3/4	+ 1/8	+20.0
N	HEWLETT-PACKARO CO	80-117	84 1/8	+2 1/4	+2.7
N	HCNEYWELL INC	34- 56	44	+ 1/4	+0.5
N	IBM	227-288	266	+2 1/2	+0.9
O	MANAGEMENT ASSIST	1- 3	1 5/8	- 1/8	-10.3
O	MEMOPEX	18- 33	21	+ 3/8	+1.8
O	MICRCOATA COPR	10- 28	18	-1	-5.2
O	MOOULAP COMPUTEP SYS	4- 14	3 3/4	- 1/4	-6.2
N	NCR	24- 37	35 1/8	+ 1/2	+1.4
O	PRIME CCMRUTER INC	4- 14	12 1/2	+ 1/4	+2.0
N	REPKIN-ELMEP	19- 27	20 1/2	- 1/8	-0.6
N	RAYTHEON CO	45- 67	63 1/4	-1 1/8	-1.7
N	SRERPY PANO	40- 52	45 7/8	+ 7/8	+1.9
O	SYCOR INC	11- 31	11 1/4	- 1/2	-4.2
A	SYSTEMS ENG. LABS	6- 10	7	+ 1/4	+3.7
N	VARIAN ASSOCIATES	12- 17	12 3/8	- 1/8	-1.0
A	WANG LABS.	11- 20	14 1/2	+ 1/4	+1.7

LEASING CCMPANIES

EXCH		1976 PANGE (1)	CLOSE OCT 27 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	CCMOISCO INC	3- 10	8 1/2	- 1/4	-2.8
A	CCMMERCE GPOUP CORP	2- 3	1 7/8	0	0.0
A	CGMPUTER INVSIRS GRR	1- 3	1 3/8	- 1/4	-15.3
M	GATRONIC PENTAL	1- 8	7/8	0	0.0
A	OCL INC	1- 1	5/8	0	0.0
N	ORF INC	5- 8	7	+ 3/8	+5.6
N	ITEL	6- 15	12 5/8	0	0.0
N	LEASCG COPR	6- 19	18	+ 1/2	+2.8
O	LEASRAC CORP	0- 1	1/8	0	0.0
O	NRG INC	0- 1	1/8	0	0.0
A	PICNEER TEX CORP	6- 9	7 3/8	+ 1/8	+1.7
N	U.S. LEASING	7- 12	9	+ 3/8	+4.3

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-EALT-WASH
L=NATIONAL; M=MIOWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE 8IO PRICES AS OF 3 P.M. CR LAST 8IO
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SOFTWARE & EOP SERVICES

EXCH		PPICE 1976 RANGE (1)	CLOSE OCT 27 1976	WEEK NET CHNGE	WEEK RCT CHNGE
O	AOVANCEO CCMP 7ECH	1- 3	1 3/8	- 1/R	-8.3
O	ANACOMP INC	6- 11	7 1/8	- 3/8	-5.0
A	ARPLIEO CATA RES.	2- 4	3	- 1/4	-7.6
N	AUTCMATIC OATA PPOC	17- 35	28	+ 5/8	+2.2
O	CCLEMAN AMERICAN CDS	2- 6	2 3/8	+ 1/8	+5.5
O	COMPUTEP OIMENSIONS	3- 7	5 7/8	+ 1/8	+2.1
O	CCMP ELECTICN SYSTMS	5- 9	5 1/4	0	0.0
O	CCMPUTER HOPIZONS	1- 2	1 1/4	0	0.0
O	CCMPUTEP NETWORK	2- 6	4 1/2	- 1/2	-10.0
N	COMPUTER SCIENCES	4- 8	5 7/8	0	0.0
O	CCMPUTER TASK GPOUP	1- 2	1 1/2	+ 1/4	+20.0
O	CCMPUTEP USAGE	3- 6	2 7/8	- 1/4	-8.0
C	CCMSHARE	2- 9	4 3/4	+ 1/4	+5.5
O	DATA CIMENSICNS INC	2- 4	2 3/4	0	0.0
O	DATATAB	1- 1	1 3/8	0	0.0
N	ELECTPONIC OATA SYS.	12- 18	15	- 1/2	-3.2
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	INSYTE CORR	1- 3	1 3/8	- 1/4	-15.3
O	IPS CCMPUTER MARKET.	1- 2	1 3/8	+ 1/4	+22.2
O	KEANE ASSOCIAIES	2- 4	2 1/2	+ 1/4	+11.1
O	KEYCATA COPP	2- 5	1 3/4	+ 1/8	+7.6
O	LOGICON	3- 4	4	+ 5/8	+18.5
A	MANAGEMENT CATA	1- 3	2	- 1/8	-5.8
A	NATICNAL CSS INC	13- 25	19 3/8	- 1/4	-1.2
A	ON LINE SYSTEMS INC	17- 22	17	- 3/8	-2.1
N	PLANNING PESEAPCH	3- 5	3 5/8	+ 1/4	+7.4
O	PPOGPAMMING & SYS	1- 1	3/8	0	0.0
O	RAPIDATA INC	2- 5	1 3/4	+ 1/8	+7.6
O	PEYNCLDS & REYNOLO	13- 21	15 1/2	+ 1/2	+3.3
O	SCIENTIFIC COMPUTEPS	1- 1	7/8	0	0.0
O	TYMSHARE INC	15- 28	15 1/2	-2 1/2	-13.8
A	UPS SYSTEMS	3- 5	4 1/8	+ 3/8	+10.0
N	WYLY CORP	2- 7	1 5/8	- 1/8	-7.1

PEPIPHERALS & SUBSYSTEMS

EXCH		1976 RANGE (1)	CLOSE OCT 27 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADCRESSOGRAPH-MULT	8- 13	10	+ 1/8	+1.2
O	AOVANCEO MEMCRY SYS	4- 10	6 3/8	- 1/4	-3.7
N	AMREX CORR	5- 10	6 3/4	+ 1/2	+8.0
O	ANOEPSCN JACOBSON	2- 4	3 1/4	+ 3/8	+13.0
O	APPLIEO OIG DATA SYS	13- 25	18 1/2	- 1/2	-2.6
O	BEEMIVE MEOICAL ELEC	3- 9	8 1/4	0	0.0
A	BOLT,BERANEK & NEW	7- 11	8 1/4	+ 3/8	+4.7
N	BUNKEP-RAMO	5- 10	7	+ 1/2	+7.6
A	CALCOMP	4- 7	4 1/8	+ 1/8	+3.1
O	CAMBRIOGE MEMORIES	0- 6	1/2	+	+12.5
N	CENTRCNICS DATA CONP	20- 36	26 1/8	-3 1/8	-10.6
O	CCOEX CORP	22- 42	28	-3	-9.6
O	COGNITRCNICS	1- 1	3/4	0	0.0
O	CCMPUTER CCMMUN.	1- 6	4 7/8	- 1/8	-2.5
O	CCMPUTER CONSOLES	4- 7	3 3/4	- 3/4	-16.6
A	CCMPUTER EQUIRMENT	1- 3	1 3/4	- 1/8	-6.6
O	CCMPUTER TRANSCEIVER	1- 3	3/4	0	0.0
O	CCMTEN	4- 9	7 1/4	+ 1/2	+7.4
N	CCNRAC CORP	20- 25	21 7/8	+ 7/8	+4.1

EXCH		RRICE 1976 PANGE (1)	CLCSE OCT 27 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	GATA ACCESS SYSTEMS	1- 5	4 1/2	0	0.0
O	OATA 100	7- 13	8 1/8	- 1/8	-1.5
A	OATA PPODUCTS CORP	5- 15	10 5/8	- 1/4	-2.2
O	OATA TECHNOLCGY	1- 2	1 3/8	+ 1/8	+10.0
O	DATUM INC	1- 2	1/2	- 3/8	-42.8
O	OECISION OATA COMRUT	1- 4	1 5/8	0	0.0
O	OELTA DATA SYSTEMS	1- 1	1/2	- 1/P	-20.0
N	ELECTPONIC M & M	1- 4	2 7/8	- 1/4	-8.0
O	FABRI-TEK	1- 1	7/8	+ 1/8	+16.6
O	GENERAL CCMPUTER SYS	0- 2	3/8	- 1/R	-25.0
N	HAZELTINE CORP	4- 12	8 1/2	+ 3/8	+4.6
N	HARRIS CORP	34- 55	50 3/8	- 1/8	-0.2
A	INCOTEPM COPP	9- 20	12 1/4	- 3/8	-2.9
O	INFOPEK INC	3- 7	4 3/8	+ 1/4	+6.0
O	INFORMATICN INTL INC	10- 18	12	0	0.0
O	INTEL CORP	53-109	54 1/2	-4 1/2	-7.6
A	LUNOY ELECTPCNICS	3- 7	3 5/8	0	0.0
O	MSI DATA COPP	3- 7	5 7/8	0	0.0
A	MILGO ELECTPCNICS	15- 21	18 1/8	+1 3/8	+8.2
N	MOHAWK DATA SCI	3- 10	5 3/4	- 1/2	-8.0
O	PENRIL CORP	1- 3	1 7/8	0	0.0
A	PERTEC CORP	3- 8	5 5/R	- 3/R	-6.2
A	ROTTEP INSTRUMENT	2- 2	1 3/4	0	0.0
O	RPECISION INST.	3- 10	2	- 1/2	-20.0
O	OUANTCP COPP	4- 6	3 3/4	- 1/8	-3.2
O	RECOGNITION EQUIP	6- 11	8 1/4	+ 3/8	+4.7
N	SANOERS ASSOCIATES	6- 11	7 3/4	- 1/4	-3.1
O	SCAN CATA	1- 4	1 1/4	- 1/4	-16.6
O	STCPAGE TECHNOLOGY	9- 13	9 3/4	- 1/4	-2.5
O	T BAP INC	5- 10	5 1/2	- 1/4	-4.3
O	TALLY CORP.	4- 6	3 7/8	0	0.0
O	TEC INC	3- 7	6 1/4	0	0.0
N	TEKTPCNIK INC	45- 69	60 3/4	-1 5/8	-2.6
N	TELEK	2- 5	2 1/2	- 1/8	-4.7
O	WANGCC INC	11- 22	21 1/8	0	0.0
O	WILTEK INC	2- 2	1 3/4	+ 1/8	+7.6

SUPPLIES & ACCESSORIES

EXCH		1976 PANGE (1)	CLCSE OCT 27 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCEO SYSTEMS INC	1- 4	3 3/8	0	0.0
O	BALTIMOPE BUS FORMS	3- 5	3 5/8	0	0.0
A	BAPPY WPIGHT	6- 10	8 3/4	0	0.0
O	CYBERMATICS INC	1- 1	1/2	0	0.0
A	CATA COCUMENTS	25- 45	45 1/4	0	0.0
O	OUPLEX PRODUCIS INC	13- 24	13 1/4	- 1/8	-0.9
N	ENNIS BUS. FORMS	6- 8	5 1/2	- 1/8	-2.2
O	GPAHAM MAGNETICS	8- 13	9 1/2	- 1/2	-5.0
O	GPAPHIC CONTPOLS	13- 19	16 1/4	+ 1/2	+3.1
N	3M COMPANY	53- 66	60 1/4	-1	-1.6
O	MOCPE COPP LTD	32- 51	33	+ 1/4	+0.7
N	NASHUA COPR	11- 18	17 1/8	- 1/8	-0.7
O	STANCARO REGISTEP	15- 19	17 1/4	- 1/4	-1.4
O	TAB PPOOUCTS CO	5- 11	8 3/4	- 3/4	-7.8
N	UARCO	19- 25	19 1/4	- 3/4	-3.7
A	WABASH MAGNETICS	4- 9	8 3/4	- 1/4	-2.7
N	WALLACE BUS FORMS	19- 25	21 3/4	- 1/4	-1.1

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The Debate Goes On

EFT Witnesses Spar On Dangers to Users

By Toni Wiseman
Of the CW Staff

WASHINGTON, D.C. – Electronic fund transfers (EFT) systems could open a Pandora's box of consumer woes, including fraud, theft and unauthorized access, according to recent testimony given to the National Commission on Electronic Fund Transfers.

But the degree of threat and whether it is specifically related to the automating of banking were questions widely disputed by those testifying.

Security precautions traditionally come along as the need warrants in the manner that locks and vaults were designed, according to Willis Ware, computer scientist for Rand Corp.

By contrast, an EFT network will be designed and implemented as a system complete with safeguards, he asserted. The system designers will anticipate the possibility of threats beforehand and will act to counter them, he said.

The industry can provide some safeguards, he said, adding it is up to financial institutions to determine threats and select available safeguards.

"In EFT, on the other hand, the very capabilities a user will have in his system can be used by a knowledgeable outsider to turn the system against him."

The problem, he said, is people. Security becomes a problem when people perceive some anomaly in the system and take advantage of it, just as in the past tellers have been captured and forced to open a vault, he remarked.

Carol Greenwald, commissioner of

(Continued on Page 4)

For Reform Act Lobbying

Bell Admits Spending Over $1 Million

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – How much money have AT&T and the independent telephone industry spent so far to lobby for the Consumer Communications Reform Act?

The answer depends on how the term "lobbying" is defined.

According to Rep. Tim Wirth (D-Col.), "the Bell System spent $1,040,009 between April 1 and June 30 in connection with its lobbying effort."

But an AT&T spokeswoman disagreed with Wirth. Bell spent only $600,000 in lobbying for support of the Reform Act during the second quarter, she said.

AT&T defines lobbying as direct personal contacts made by Bell System executives to members of Congress to sell them on the merits of the legislation, she indicated.

The other $400,000 was spent on pamphlets and brochures distributed mainly to stockholders and employees, according to the spokeswoman. A portion of the $400,000 also went for meetings held by various Bell operating companies to inform employees about the pending legislation, she said.

According to the Internal Revenue Service (IRS) rules, the entire amount should be allocated for lobbying expenditures, a spokesman for Wirth noted.

Commenting on the lobbying totals supplied by Bell to both the House Oversight Committee and the Federal Communications Commission (FCC), Wirth said the expenditures were part of "one of the most intensive lobbying campaigns in recent years."

"Will AT&T's stockholders pay [for the lobbying] or will it somehow be passed on to the public?" Wirth asked. The IRS "specifically prohibits the deduction of any expense incurred in connection with any attempt to influence the general public . . . with respect to legislative matters.

"I intend to seek clarification on both these points from AT&T Board Chairman John deButts," Wirth said.

In late September, deButts testified before the House Subcommittee on Com-

(Continued on Page 6)

Three Insurance Firms Named For Illegally Procuring Records

By Nancy French
Of the CW Staff

DENVER – The Northwestern National Insurance Group of Milwaukee, the Home Insurance Group of New York and the Reliance Insurance Co., also of New York, are among the 56 insurance companies indicted in district court here for illegally obtaining individuals' personal records.

Charges included conspiracy to commit theft, criminal solicitation and receipt of stolen property, according to a spokesman for a district attorney.

The three firms are among those that hired Factual Service Bureau, Inc., to obtain sensitive personal information from government, medical and credit card company data banks for use in settling insurance claims [CW, Nov. 1].

Factual was charged with conspiracy, impersonation and theft of trade secrets for illegally obtaining the records using only a telephone and a well-documented system of subterfuge, according to evidence presented to the grand jury.

In addition to facing criminal action, the three are among 110 insurance companies being investigated by the Colorado State Insurance Commissioner to see whether they also demonstrate "a pattern of unfair claims practices," according to Insurance Commissioner J. Richard Barnes.

If so, the firms could be fined a maximum of $50,000 or $10,000 per offense, as well as having their licenses revoked or suspended, Barnes said.

Criminal hearings are set in the state court here for February and a hearing before Barnes will follow, he said.

Rep. Barry Goldwater Jr. (R-Calif.) has met with representatives of the Federal Bureau of Investigation, the Justice De-

(Continued on Page 2)

AT&T Setting Stage at Info '76 For Debut of Modems, Terminal

By Ronald A. Frank
Of the CW Staff

NEW YORK – Three data communications devices, two of which are new for telephone companies, will be introduced by AT&T this week at the Info '76 conference in Chicago.

AT&T will show its full-duplex 1,200 bit/sec data set, the Model 212A. Full-duplex transmission of data at 1,200 bit/sec was pioneered by Vadic Corp. in 1973 and, earlier this year, Universal Data Systems introduced a modem with similar capabilities.

The Model 212A was developed by the Bell System and reportedly will not be compatible with the existing independent vendor products. But one of the independent suppliers may consider offering a Bell-compatible modem that would operate with the 212A, depending on the technical characteristics of the new Bell device, according to an industry source.

The 212A has not yet been tariffed, but it will be priced in the $30- to $50/mo range, according to an AT&T spokesman.

The 212A operates in three modes on the dial-up telephone network. In addition to its "native" full-duplex 1,200 bit/sec operation, it operates in 202-type mode at 1,200 bit/sec half-duplex and in 103-type mode at full-duplex up to 300 bit/sec, he indicated.

(Continued on Page 2)

Ballot Counting With DP Has Few Flaws

A CW Staff Roundup

An estimated 16 million ballots cast in last week's national election were tabulated by computer compared with the previous high of 10 million during the 1974 general election.

Computer systems were used to tabulate ballots in 35 of the 38 states that have authorized their use and by more than 350 separate jurisdictions, according to P.J. Lyons of Computer Election Systems (CES), the largest firm marketing computerized voting systems. CES systems use voter-punched standard 80-column cards.

Computer systems previously had been used by a maximum of 260 jurisdictions in 28 states, Lyons said.

The problems that plagued past elections were almost absent – with an able assist from the weatherman. In prior years, users of punch card systems experienced trouble counting rain-dampened ballots, but clear weather over most of the country this year prevented a recurrence of those snafus.

Another problem with punch card ballots in previous years resulted from chad remaining on the cards after the holes were punched, which threw off some of the counts. However, no chad problems were reported this year and no jurisdictions polled by *Computerworld* found the "mystery holes" that had appeared in the cards in some earlier elections.

One problem that did crop up this year was caused by the unexpectedly large voter turnout, Lyons said. Many jurisdictions ran dangerously low of ballots, but depletions were avoided by shifting ballots from lightly voting precincts to the heavier areas.

Another new development for this election was forced by the large number of candidates and issues facing voters in some jurisdictions.

For example, Cook County, Ill. (Chicago), was the first jurisdiction in the country to move to a new card layout permitting as many as 312 positions to be placed on a punch card. In earlier elections, the maximum number of positions on a card – and therefore the maximum number of candidates and issues – had been 228, Lyons said.

In California's Alameda County, where voters selected their candidates on CES punch cards, processing went very smoothly for such a large election, according to Jim Riggs, registrar of voters.

DP personnel began processing absentee ballots at 8 p.m. Tuesday night and

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Youthful Offenders Misclassified

New York Busy Retrieving FBI Records

By Catherine Arnst
Of the CW Staff

ALBANY, N.Y. – Employees at the New York State Division of Criminal Justice Services are searching the state's entire data base of computerized arrest records to find an estimated 67,000 records never purged by the Federal Bureau of Investigation (FBI) because they were never given "youthful offender" status.

As they are found, the names of youthful offenders are being forwarded to the FBI to update manually filed arrest reports miscategorized until 1975.

By law, youthful offenders' records must be kept confidential except by court order, which means the FBI is also prohibited from giving out that information. New York, however, neglected to follow up the arrest records it had sent to the bureau and the FBI was unknowingly giving employers information on youthful offenders who were New York residents.

The state realized its error in May 1973 and by 1975 worked out a system that allowed it to supply dispositions on youthful offender arrest records the bureau is sent each time an individual is arrested.

Bank Employee Fired

However, there was still a problem with the files the state sent to Washington before that date. This resulted in at least one known case where a 29-year-old man was discharged from his job at a bank recently because of an arrest in 1966, even though he had been ruled a youthful offender and his record should not have been available.

While federally insured banks are legally barred from hiring anyone who has been convicted of a criminal offense involving "dishonesty" or "breach of trust," youthful offenders – defendants between the ages of 16 and 19 – are not viewed as criminals and are not subject to that regulation.

After the bank employee lost his job because of information unlawfully released (he has since been rehired) the American Civil Liberties Union asked the state Division of Criminal Justice Services to start retrieving all youthful offender records from the FBI.

The state is attempting to do that now, but the process is a slow one. Although New York has computerized its files, tha FBI still maintains most of its arrest records manually and can only remove files at the rate of 1,000 per week.

In addition, New York has more than 100,000 records it has not yet added to its data bank; it has yet to work out an effective system for locating the files of youthful offenders in these records.

The FBI has been held blameless in the mishandling of youthful offender records since "it had obviously not been advised by anyone in New York State to withhold such information," the director of data systems for the Division of Criminal Justice Services said.

AT&T Unveilings Set For Info

(Continued from Page 1)

AT&T also will unveil its first portable data terminal, the 43 teleprinter. The keyboard/printer unit operates at 30 char./sec on the dial-up network and weighs "under 30 pounds," the spokesman noted.

The portable teleprinter operates with an integrated modem and attaches to a telephone line using the standardized plug-and-jack arrangement recently approved as part of the registration/certification program instituted by the Federal Communications Commission (FCC), he said.

The 43 teleprinter was described as designed to comply with the FCC registration/certification regulations, but it marks the first Bell System data terminal that can be attached and moved by a user wherever a plug-and-jack arrangement is available. The Bell System has not previously offered a portable data terminal.

The teleprinter will cost about $90/mo although it is not yet tariffed, the spokesman said.

The third AT&T unit that will be introduced is an improved version of the Bell 103A3 data set. Following the characteristics of the smaller 200 series LSI data sets introduced earlier by AT&T, the 103J includes a smaller cabinet, status lamps and diagnostic indicators.

The data set operates on the dial-up network at speeds up to 300 bit/sec and will be priced at about $28/mo, he added.

All three of the AT&T data communications units will be shown and demonstrated for the first time this week. Tariffs can be expected to be filed "at any time" by operating companies within the Bell System, the spokesman indicated.

Three Insurance Firms Indicted

(Continued from Page 1)

partment and the Internal Revenue Service in an effort to initiate an investigation within those departments.

In addition to sidestepping security safeguards in federal data banks, hospital record rooms and physicians' offices, Factual also obtained secret credit card company telephone code numbers to obtain individuals' credit records for the insurance companies, according to a Goldwater aide.

As a result of his involvement in the investigation of the privacy violations allegedly committed by the insurance vendors and Factual Service Bureau, Goldwater has received numerous telephone and written reports of other similar violations from former employeas of other insurance companies and investigative agencies, the aide said.

Privacy Unit Sets Meetings

WASHINGTON, D.C. – The Privacy Protection Study Commission will hear presentations on the recordkeeping practices of statisticians, researchers and federally funded public assistance and social services programs here on Nov. 10.

This meeting is in addition to the Nov. 11-12 public hearings previously announced.

It will be held in Room 2358 of the Rayburn House Office Building from 9:30 a.m. to 5:30 p.m.

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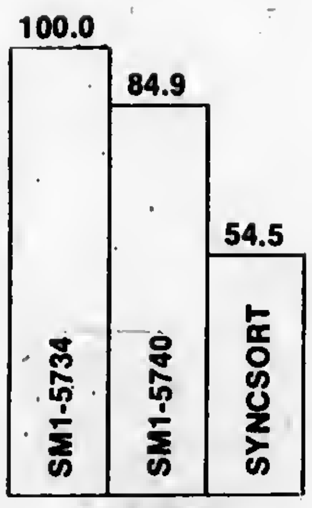

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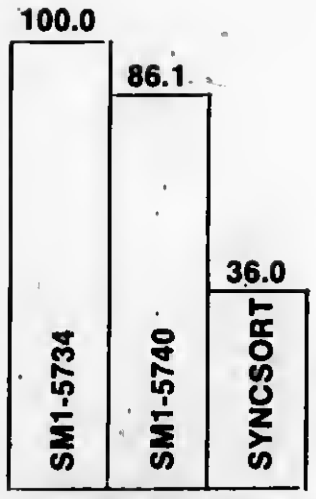

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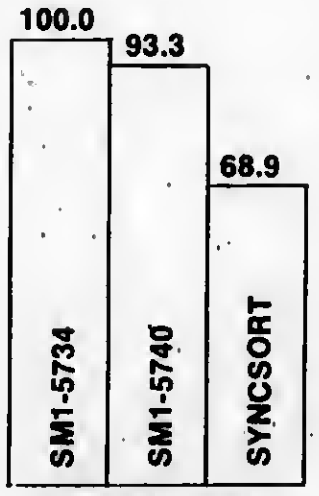

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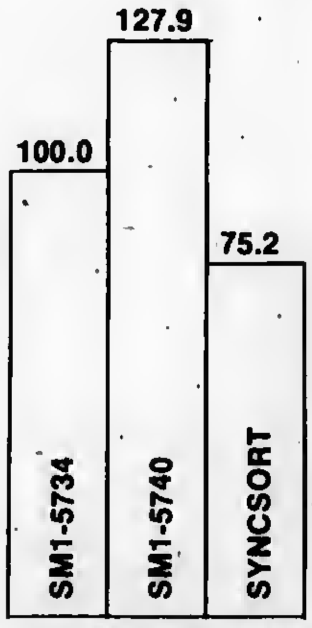

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Attorney Suggests Congress as Forum

Much Talk But Little Action Seen for Software Patents

By Don Leavitt
Of the CW Staff

MENLO PARK, Calif. – Fifteen years of public debate and seven years of "piecemeal" judicial consideration have produced "substantial verbiage but little agreement" on the legal and policy issues raised by bids for software patents, according to Susan Nycum, a California attorney.

Congress seems to be the most appropriate forum for the resolution of the program-related patent question, Nycum said in a study prepared for the National Science Foundation recently.

Entitled *Legal Protection of Proprietary Rights in Software*, Nycum's report found it "difficult to avoid the harsh conclusion" that much of what has been written about the program patent issue has been "unenlightening and, at times, nonsensical" when measured by the requirements for a rational resolution of the issues.

In trying to help the courts grasp the subject matter of programs, claims have equated them on the one hand with machines and, on the other, with human thought processes.

"In sum, one side has tended to argue the ridiculous while the other has countered with the obvious," the San Francisco lawyer continued.

Efforts to construct doctrines of limitation appropriate to this subject matter "might have exercised a beneficial influence" in closing the gap between the U.S. Court of Customs and Patent Appeals (CCPA) and the U.S. Supreme Court, Nycum suggested. Up until now, she said, the CCPA has "revealed a preference for ignoring limitation policies" while the Supreme Court has a "poorly articulated and defended preemption limitation."

Policy Debate Useless

If anything, the policy debate over software patents "has been even less useful than its more strictly 'legal' counterpart," Nycum said.

References to the economic size of the DP industry and the significance to society of computer applications are "frequently encountered." So are comments noting that patents, even if available to program-related inventions, "would be of scant interest to most program developers," she added.

But "the critically important economic issues have received very little clarification," she said, noting that "limp assertions" about the impact of patentability on program innovation have not been backed with any evidence.

"Of more serious concern," she continued, "is the adequacy and quality of software itself." Economic analysis has tended to stop at "mere declarations, occasionally supported by the recitation of a few anecdotes.

"Also unpersuasive" have been arguments in favor of patents grounded on appeals to "justice" and equal protection for innovators of hardware and software, the attorney went on.

"If it is assumed the absence of patent protection reduces the relative returns to software investment, this in itself indicates only that the complaining software producers should have invested in hardware innovation instead."

Finally, she complained, "the problem in the program-related patent area is not that policy issues have been argued, but that they have been argued poorly."

Patent Office Opposition

One of the major factors shaping the debate over patents for software has been opposition from the U.S. Patent Office. An adequate explanation of its position has to recognize "the prolonged lack of enthusiasm for such patents, the sudden hardening of that position in 1968 and the sustained vigor of that opposition despite changes in commissioners since 1969," Nycum said.

While the Patent Office is obligated to promote the public interest, "it has its own set of institutional interests to defend," she contended.

There seems to be a belief that computer programs pose "unprecedented problems" in the anticipation and prior arts areas and that a solution to these problems is "not foreseeably available," she said.

A fear that a clear holding of patentability would produce a "flood" of applications and their processing "would tax Patent Office resources far beyond Congress' willingness to provide additional support" is another factor in the office's thinking, Nycum added.

Concern that program-related patents could be used to gain economic leverage "in areas previously denied patent coverage" and an "unwillingness to see the patent system exploited" as a tool in the struggle between major economic interests have also affected the Patent Office, she said.

Finally, she said, "once it was decided to take an adamant stance, [the Patent Office had] a perceived requirement to defend it without compromise."

Patents Advocated

An attempt to resolve the program patent question is "beyond the scope of this study," she said, but asserted "program-related inventions should be routinely processed through the [patent] system unless shown to present novel and significant challenges to fundamental patent policies."

Subject matter objections that characterize programming as "setting switches" and the like "are simply insubstantial . . . nor is the apparent preemption of an idea or an algorithm a sufficient ground for objection."

Such objections have often constituted the foundation of attacks on program-related patents, she noted, before adding ironically "if they were a comprehensive statement of the peculiarities of the subject matter, the case for patentability would be compelling."

The 118-page report, written with help from research assistant Lawrence Robinson and cataloged as SRI Project 5068, is available for $7/copy from Stanford Research Institute here in Menlo Park, Calif. 94025.

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EFT Witnesses Spar Over Dangers to Consumers

(Continued from Page 1)

banks for the State of Massachusetts, noted the problems of electronic theft have been exaggerated in many discussions of EFT.

"While the transfers can be swift and impersonal, access to enable unauthorized transfers electronically is in the hands of a limited number of people," she asserted.

"Furthermore, various codes and requirements for electronic or telephone confirmation of transfers above specified amounts can significantly limit, if not eliminate, exposure," she said.

Kenneth Larkin, speaking on behalf of the American Bankers Association, said whether or not privacy is involved, security breaches are an economic threat.

"While the potential for fraudulent or unauthorized use of an EFT account certainly exists, it is considerably reduced by virtue of the personal identification number (PIN)," he said.

The PIN does not appear on the access card, is known only to the customer and the computer and must be keyed into the terminal correctly to activate the account, he noted. An access card, if lost or stolen, could not be used to withdraw funds from the owner's account unless the PIN were also known.

Kathleen O'Reilly, legislative director of the Consumer Federation of America, referred to a Mitre Corp. study which indicated computer technology is already available to minimize, if not totally eliminate, computer fraud.

"It is incumbent upon the industry, which has invested more than $50 million in the research and development of EFT, to likewise commit an appropriate sum to research aimed at protecting and implementing a fraud-proof computer system," O'Reilly stated.

She also questioned "whether technology is available or could be developed which would allow a customer, who is being forced to withdraw funds for a waiting assailant, to alter the punching out of the PIN number in such a way as to activate an alarm which signals to the security guard or police that a crime is being committed."

EFT opponents based their arguments on a variety of points.

Sen. Anthony Derezinski of Michigan noted security of EFT systems covers a broad range of potential problems: unauthorized disclosure of information, errors in accounts, theft in the most traditional sense at terminals and computer theft both of individual accounts and penetration of the entire system.

Obviously, errors will occur with EFT systems just as they now occur with traditional paper systems, but "anyone who has ever had experience with computerized billing shudders at the prospect of what may happen with EFT unless safeguards are built in," Derezinski said.

What is critical, he maintained, is that a consumer has an adequate means of ascertaining when an error has been made in his account and how to obtain redress.

Derezinski suggested legislation mandating periodic statements "in a human readable and understandable form" would meet this need and noted such a matter could most easily be handled through the Uniform Commercial Code.

Roberta Wieloszynski, director of the consumer affairs office in Syracuse, N.Y., addressed the issue of stolen cards.

If a credit card is stolen, prompt action by a consumer means he doesn't lose anything; if a check is stolen and forged, the bank, not the consumer, accepts the loss, she said.

"But EFT debit cards introduce a new element," she argued. "Since transactions are recorded instantaneously, the problem a consumer faces is to have funds restored.

"And since funds taken illegally from an EFT account can't be used by a consumer until they are restored, a consumer may find he's accruing penalties because bills can't be paid," she said.

Earl Ward, president of AFS Associates and representative for the Independent Bankers Association of America, noted EFT systems, which are accessed by the public using unattended automated teller machines (ATM), open the transfer system to many more security hazards than would be found in a traditional bank.

An EFT network is only as good as the telephone lines connecting terminals and the computers operating them and only as strong as the weakest terminal in the network, he stated.

Furthermore, reproducing encoded cards and PINs to activate ATMs is no great feat, he observed.

Far from agreeing with earlier testimony that the PIN is adequate security, Ward argued the PIN can be separated from its legitimate owner; it is decodable and penetration can occur accidentally because of software problems.

There have been few attacks reported against ATMs to date, he noted. "However, as outsiders become aware of the potential, attacks against these electronic symbols of the establishment could develop into a 'fad' crime," he said, noting the popularization of these attacks may already be under way since 25 million people viewed a segment of CBS' "60 Minutes" during which Jerry Schneider used his home telephone to raise reporter Dan Rathers' credit limit from $500 to $10,000.

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Few Flaws Cited as DP-Cast Ballots Hit Record High

(Continued from Page 1)

by 10 the DP center was "backlogged with ballots from most of Oakland's precincts," Riggs said.

Reading the punch cards into a pair of ballot multiplexing minicomputers in half-hour batches and running the resulting tapes through an IBM 370/155 for summaries, the counting job was completed by 2:26 a.m., he reported.

In California's Santa Barbara County, a burned-out power supply could have caused problems if DP personnel had been without an effective backup system, according to Darrell Tate, manager of data services.

The burnout occurred at 7:30 Tuesday morning, leaving the county's IBM 370/145 out of commission all day.

DP personnel moved their tabulation operation to nearby Raytheon Corp. where punch card ballots were processed from 8 p.m. until about 11 p.m., when IBM service personnel had the county's Model 145 "stabilized," according to Tate. The tally was completed by 4:30 a.m.

Santa Barbara County uses the Cubic Votronic system, where choices are inked onto optically scanned paper ballots that are preprocessed in the precincts with scanning devices.

In Santa Clara (Calif.) County, where the CES Votamatic system has been used since 1966, counting would have gone just as smoothly as in Santa Barbara County if the ballots from one of the precincts had not been "lost," according to Hans Harder, assistant registrar of voters.

The problem began when one of the young inspectors found his car blocked in the parking lot. He borrowed a car to take his punch cards to the receiving center, but it broke down on the way.

Rather than phoning in, the inspector hiked to a friend's nearby apartment to spend the night and turned up with his box of cards at 10:30 the next morning, Harder explained.

The rest of the county's ballots had been counted by 1 a.m., he said.

Fulton County, Ga., which has also been using computers to count ballots since 1966, had an uneventful tabulation despite the unusually high voter turnout, according to Mack Dennis, assistant supervisor of elections for the county.

Two machines, one located in Atlanta City Hall and one at Fulton County's DP center, were used to count the punch card ballots, which Dennis said were punched with a Data Media vote recorder.

Fulton finished tabulating votes at 4:23 a.m., he said, and might have finished sooner except that some polls stayed open late to accommodate long lines of voters.

The rate of defective cards was a low 500 out of 205,034, he said. A card is defective when punched with something other than a stylus. Cards that were rejected were repunched and fed through the sorter again, he said.

Write-In Problem

The computer-assisted ballot tabulation in Boone County, Mo., ran smoothly, too, but the county had to set up a manual counting system to accommodate a write-in candidate, according to Murry Glascock, county clerk.

Between 7,000 and 9,000 votes out of the 35,600 cast were for a write-in candidate for sheriff. As a result, the count was not completed until after 7 a.m. Wednesday morning, he said.

The county, which has counted ballots by computer since 1971, has processed as many as 32,000 ballots by 11:30 p.m. when there were no write-in candidates, he said.

In Michigan's Kent County, where Grand Rapids is located, officials completed the vote count in three and a half hours, stopping only a couple of times to blow card dust off the reader "as a preventive measure," according to Rawson Weaver.

Kent County used a Burroughs B3500 with a Model 800 card reader and printer.

Vote counters in Genesee County, Mich., were also pleased with their CES system, but had problems with the human interface, according to Michael Carr, county clerk-elect.

Although the polls closed at 8 p.m., the final votes were not counted until the following 8:30 a.m. The delay was caused by the extremely high turnout of 178,171 voters, late delivery of ballots to the computer center and a high percentage of absentee ballots which were not punched properly by voters, Carr said.

Cook County in Illinois used minicomputers in all precincts and officials were actually astounded by the results, according to Stanley Tusper, county clerk.

CES developed a special precinct ballot counter to total the county's votes at the polling places. The precinct ballot counter is a microcomputer and the only one of its kind in the world, Tusper said.

"We are very pleased with the outcome and feel it has more advantages than the central tally system," he said.

In Gloucester County, N.J., there were no real technical problems, but operations were stymied for a while when the computer refused to accept data from the Univac terminals, according to John Gormley, DP supervisor.

A clerk, however, came up with the solution after realizing the computer would accept data sent with a protected display. The problem had arisen because the terminal operators were using the button with an unprotected display.

Only its 26,000 absentee ballots were counted by computer in Ohio's Cuyahoga County. The polls closed at 7:30 p.m. Tuesday, and the absentee ballots were tabulated at 7:31, according to Robert Varni, DP manager.

Some 4,000 additional ballots came in a later mail delivery, he said, but even these were finished by 8:30 p.m., the earliest time ever recorded for the county.

Cuyahoga used a CES Votamatic system with one operator running the punch cards through the system.

In El Paso, Texas, voters registered their preferences on machines leased from CES. Tabulation was performed on the county's Univac 9400 using a program written by county programmers, according to Ray Zitur, DP manager.

Despite the largest turnout in El Paso's history – 95,658 voters – there were no major problems, he said. But counting was hampered by the large number of write-in votes for a seat in the state Supreme Court.

Bell Admits Spending $1 Million

(Continued from Page 1)

munications that AT&T spent $600,000 in lobbying for the Reform Act [CW, Oct. 4]. The latest figures do not alter the estimates provided by the AT&T chief executive, the AT&T spokeswoman stated.

Usita Busy Too

Another organization actively engaged in promoting the Reform Act is the U.S. Independent Telephone Association (Usita). A report submitted by the Usita public relations committee stated "the primary effort of the association's public relations program this year has been the development of public understanding and support for the principles involved in the Consumer Communications Reform Act."

The Usita staff developed a four-page "white paper" explaining the position of the telephone industry on "contrived competition." More than 250,000 copies of the brochure were ordered by member companies "either in convenient handout size or in [telephone] bill insert size," the report said.

Also sent to members of Usita were two news releases with quotations to be attributed to "local company management," an editorial to be offered to newspapers which was described as "moderate in tone" to achieve maximum use; an advertisement to be printed locally under company sponsorship by those firms "which felt this approach would be effective in their communities; a "stock speech" to be used by company executives; and *Phonefacts '76*, a publication with a section that gave special emphasis to the impact of competition on the consumer.

The report cited one of Usita's "largest and most successful national publicity campaigns" in support of an eonomic report on the impact of competition done by Systems Applications, Inc. "Rather comprehensive news stories were carried nationally by United Press International, the Associated Press and a number of other news services and printed in hundreds of newspapers coast to coast."

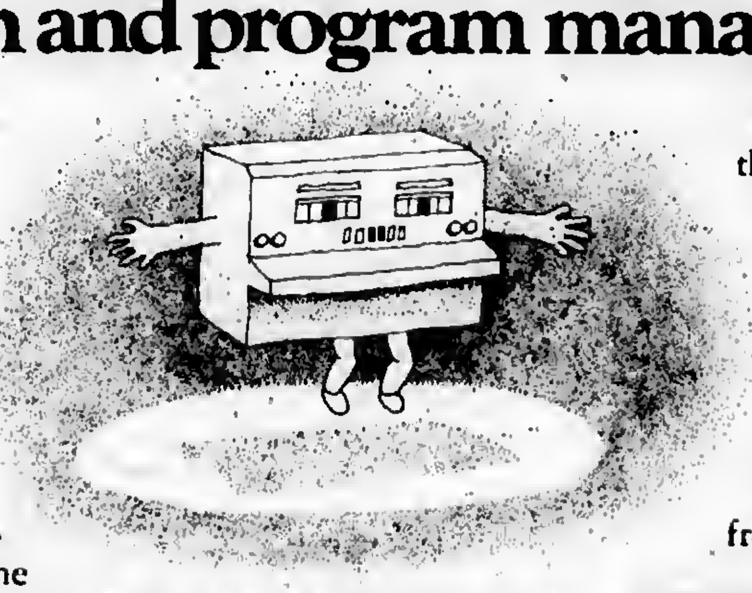
Copies of the Usita white paper were mailed to the editor of the editorial page of every daily newspaper in the nation," the report stated.

"No Usita money has been expended on media advertising on the competition issue. The public relations committee has not approved an advertising program for next year," a Usita spokesman stated.

Despite the statement, a public telations report recommended an advertising campaign for 1977 to support the legislative program on competition.

"The committee chairman and the staff are already working with Van Sant Dugdale Advertising, Usita's agency, on the new program," it added.

The Usita spokesman said the association's directors had not yet approved a budget for the forthcoming ad campaign. Asked how much the industry association had spent on all types of advertising in 1976, the spokesman answered he had no figures, but no money had yet been spent on ads related to the Consumer Communications Reform Act.



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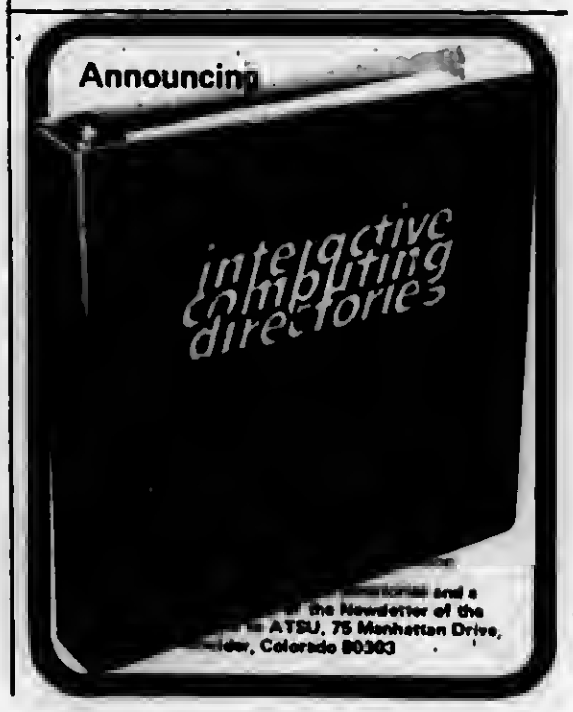

With Calcomp Starting This Week

IBM Now Besieged on Both Coasts by Antitrust Actions

By Edith Holmes
Of the CW Staff

NEW YORK – Beginning this week, IBM will be the defendant in federal courts on both coasts on similar charges.

As California Computer Products, Inc. (Calcomp) vs. IBM goes to trial before Judge Raymond McNichols in Los Angeles tomorrow, the Justice Department will begin the peripherals part of its year-and-a-half-old presentation before Judge David N. Edelstein here in Foley Square.

For the next four months – the time attorneys estimate the Calcomp suit will take in court – much of the testimony of witnesses and many of the documents scheduled to be introduced as evidence will be common to both antitrust trials.

Documents obtained through discovery of IBM by West Coast plaintiffs have already been introduced into evidence in the New York proceedings.

As a jury case, Calcomp vs. IBM could well set a precedent for Memorex vs. IBM and the other West Coast trials which are scheduled to follow it.

Calcomp vs. IBM will probably finish before the Justice Department rests its direct case and IBM counsel takes its turn at the podium.

Because the Calcomp suit will be tried before 12 citizens not accustomed to courtroom courtesies and legalese, attorneys for both sides will have sufficient incentive to make their arguments and proofs to the point. It is difficult to imagine a jury sitting through the lengthy antitrust litigation in New York.

The contest In California is also likely to be more spirited than the battle in New York has been. As an attorney involved in U.S. vs. IBM observed, the parties on the West Coast are already "at each others' throats in the marketplace."

As corporations, although of different sizes, the parties should also be able to bring comparable resources – particularly money for legal talent and clerical staff – to bear in this trial.

In hopes the Calcomp case will provide a useful diversion for IBM's lawyers, some on the government's legal staff also consider the peripherals section of the case the strongest proof of their contention that IBM is a monopolist. They look forward to seeing this portion of the conduct phase of their suit put before Edelstein.

Four Segments Completed

With peripherals the subject in court as of this week, the government has completed – for the most part – the "bundling," "fighting machines or product announcements," "education allowances" and "standards" segments of its suit.

The new courtroom procedure which permits the parties to offer documents and depositions as evidence without reading them aloud in court has speeded the proceedings considerably.

The judge's absence from the courtroom since mid-July and the lengthening of trial time from four to five hours a day and from four to five days a week on occasion have also helped to increase the trial's pace.

The contention that IBM used allowances or discounts to educational institutions to preserve its market share in this particular industry took about one-third as long to argue as did the contention that the corporation bundled software and services into its hardware prices to stifle competition, though these parts of the government's suit were of comparable sizes.

Begun on April 5, the "bundling" portion of the trial consisted of five live witnesses, readings from 18 depositions and some 232 documents; it took about 12 weeks to present. With one live witness, 11 depositions and approximately 370 documents, the case on "educational allowances" was put before the judge in a little over four weeks.

Because the change in procedure was made by Edelstein late in the presentation of the government's evidence that IBM preannounced machines to customers and then delivered devices that weren't what it promised at an anticipated loss in profits, this segment of the suit – "fighting machines" – took up 10 to 11 weeks of the trial.

Internal Documents

Since April, then, the bulk of the government's evidence has been IBM internal documents. These pieces of paper, often correspondence among members of IBM's top management or extensive in-house reports on market competition and the like, have always seemed to trial observers to be the strength of the Justice Department suit.

Many consider the documents more effective than the testimony of any of the 34 witnesses who had taken the stand by Day 207 of the trial, Oct. 29.

The documents are a problem in this case to the extent that they are both numerous and of an uneven quality. As with its witnesses, the government seems to follow a "kitchen sink" philosophy with its exhibits.

Everything – from the single-sentence memo to the 256-page report – has been introduced as evidence for the judge to read. IBM counsel follows the same approach.

On Sept. 24 when the number of exhibits in evidence so far were totaled, the court clerk came up with 1,656. Of these, 1,074 are government exhibits; 582 are IBM exhibits.

Between them, they constitute some 27,953 pages for Edelstein to wade through and weigh for their importance.

With the trial's transcript now close to 30,000 pages, the judge already has the equivalent of about 200 novels, each 300 pages in length, to review in reaching his decision – and the trial isn't even half over.

For the first time, however, it looks as though the government might complete its main case by its estimated finish date – June 1977.

The revised procedures for putting document and deposition testimony in the record, coupled with a cut in the government witness list, account for the optimism that this deadline will be met.

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Opinions on EFT Split in Hearings Before Commission

By Toni Wiseman
Of the CW Staff

WASHINGTON, D.C. – Now that the National Commission on Electronic Fund Transfers (EFT) has begun hearings on issues relevant to electronic terminals and branching, it has found the number of witnesses testifying before it equals the number of divergent opinions on the questions of legislation, regulation, sharing and branching.

The closest thing to a consensus came on the question of branching, with a clear majority of recent witnesses agreeing automated teller machines (ATMs) should not be considered branches.

But some witnesses – notably representatives of the Independent Bankers Association of America and the U.S. League of Savings Associations – disagreed.

James Smith, the former U.S. Comptroller of the Currency who brought the branch definition issue to a head last year when he ruled EFT terminals were not bank branches, told the commission prompt congressional action is imperative to enable EFT to develop "in an optimum competitive environment."

Testifying "as a private citizen," Smith argued that imposing a branch bank definition on electronic terminals will place national banks at a competitive disadvantage in relation to thrift institutions and/or state-chartered banks.

Smith opposes "restrictive regulation" on the grounds that not enough data is currently available, he said.

"Furthermore, to encase electronic terminals in the restrictive procedural and legal codes that have grown up around branch banking may materially impede the pace of development of EFT systems," he testified.

Thomas Williams, president of the First National Bank of Atlanta who testified on behalf of the Reserve City Bankers Association, agreed no "restrictive" legislation should be enacted.

He added, however, that "efficient development of EFT cannot occur without the proper legislative and regulatory environment and that environment does not exist today."

It is "improper, impractical and regressive" to try to classify ATMs and point-of-sale (POS) terminals as branches, he said.

In addition, the requirements under which a national bank establishes a new branch are totally unrealistic when applied to EFT machines; preparation of a branch application form is a substantial undertaking, costing more than most EFT terminals, he said.

The application itself costs $500 per branch, or between 25% and 35% of the cost of most POS terminals, he noted.

On the other hand, Jack Guttenberg of the Wharton School of Finance asserted the same rules should apply to terminals as to branches since, in his opinion, terminals are branches.

Preliminary Plans

WASHINGTON, D.C. – At hearings here recently, the National Commission on Electronic Fund Transfers (EFT) asked witnesses to challenge or support the commission's preliminary resolution which proposes that:

- Congress and state legislatures provide for the "timely and competitive development" of electronic banking terminals by enacting laws that are less restrictive than the present laws governing bank branches.
- Business enterprises using these terminals should not be considered regulated financial institutions or branches of the institutions.
- Congress should allow time for states to enact and implement EFT laws.
- New federal or state laws or regulations should not decrease competition among regulated financial institutions and other business enterprises.
- The commission not recommend any changes in the division of powers between the states and the Federal government in regulating financial institutions.

"That electronic terminals do not provide exactly the same bundle of services as brick-and-mortar offices does not at all justify different legal restraints on their geographical expansion any more than the different services provided by a Rolls Royce and a Pinto justify subjecting them to different traffic regulations," he said.

Favoring legislation, Guttenberg said "the historical experience of the U.S. as opposed to other advanced countries that do not have restricted branching suggests severe branching restrictions are appropriate at an early stage of economic development.

Lee Gunderson, a member of the board of the American Bankers Association, voted against federal legislation, noting that 26 states currently have enacted legislation on the EFT issue and several more are in the process of doing so.

"The legislation between states differs widely due largely to differing markets," he said. "To develop uniformity in laws would stifle evolution at a time when we don't really know where we're going."

Gunderson was not in favor of a regulatory agency such as a public utility controlling EFT, however, since "we probably have enough agencies already."

While representatives of at least two commercial banks encouraged the commission to recommend strict federal legislation lest large banks cause the extinction of the small bank, Gordon Warren dissented.

Warren, president of the Pulaski County Bank in Richland, Mo., believes "the emergence of EFT has not created a battleground between small and large banks – in fact, there's not an adversary relationship, in my opinion, between country and city banks as to EFT.

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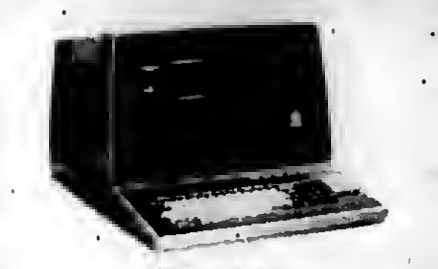

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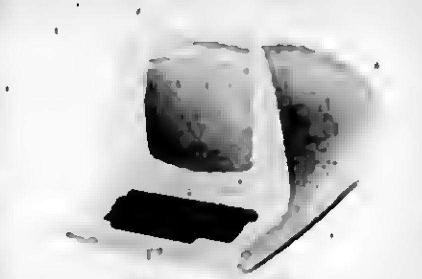

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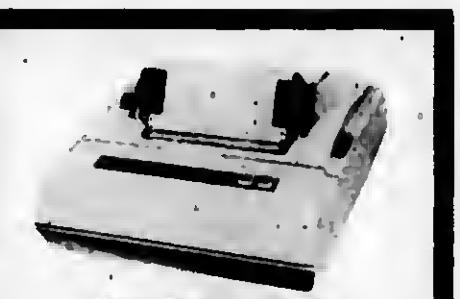

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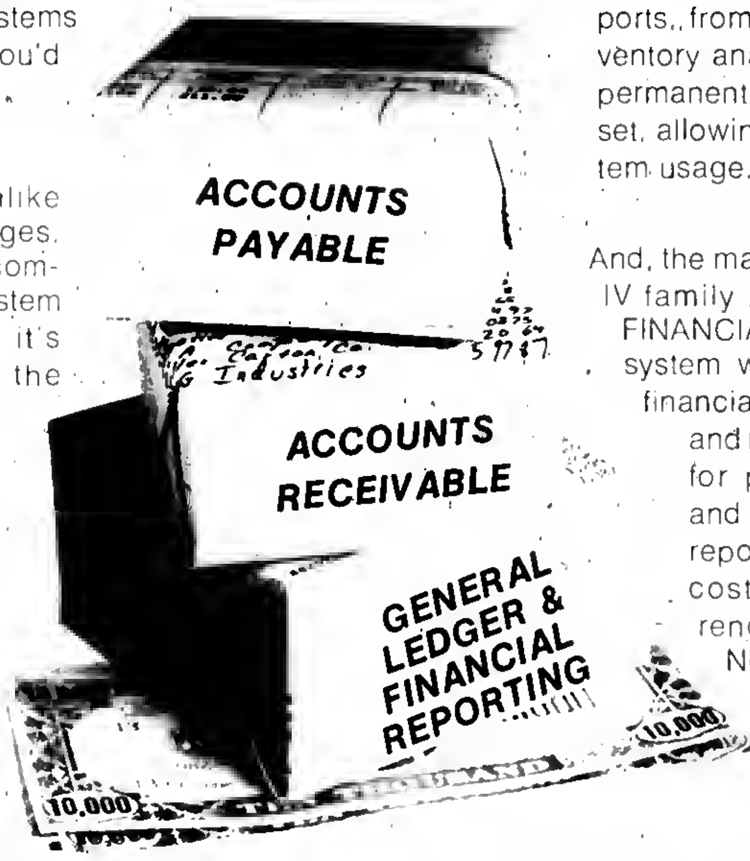

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Scandal-Ravaged Federal Office Finds System Enhancing Image

By Catherine Arnst
Of the CW Staff

DETROIT – An on-line management information system is being used by the Department of Housing and Urban Development's (HUD) regional office here to salvage its reputation after a five-year scandal that resulted in more than 200 convictions.

The scandal involved widespread corruption both within HUD and segments of the real estate industry. The fraud grew out of the "confusion and total lack of control" that permeated HUD after passage of the Housing Act of 1968, which required mortgages to be granted to low-income families, according to Charles Betterton, special assistant to the director of housing management in Detroit's HUD office.

Often these families could not keep up the payments or maintain the homes, and foreclosures of federally insured mortgages jumped from 900 to 16,000 in three years.

More properties were placed under HUD jurisdiction than the department could cope with, Betterton indicated, adding the situation was ripe for fraud and corruption.

Last year, ADP Network Servicees, Inc. was brought in to develop a system to process information on all HUD properties. As a direct result of that system, HUD has saved approximately $15 million and its inventory of active properties has dropped to 10,000 today.

HUD began the task of improving its public image and reducing its inventory two years ago after newspaper investigations spotlighted the problem. A new regional director was brought in and the organization began to purge itself of corrupt housing inspectors and loan officers.

Tracking System

The regional office did not have a comprehensive inventory tracking system, and with the large and rapid increase in properties HUD employees had no way of accurately or quickly learning the status of a property.

For example, it was common for an offer to be made and accepted for a property that was no longer available. Buyers and realtors had little faith in HUD and rarely dealt with it, and the department was losing $25 million per year from unsold properties, Betterton said.

HUD chose ADP in August 1975 to develop a system that would maintain on-line information on properties that were for sale. In the process of working with ADP to develop the system the regional office decided to put its entire inventory of 35,000 properties (those for sale and already sold) in the data bank, Betterton said.

ADP was chosen because of the flexibility of its programming language, Information Processing Language, which allows HUD employees with very little training to change programs, he added.

The system, implemented a year ago, generates 20 to 30 different types of reports. The main report is a weekly listing of all properties available from HUD, including photographs, which is distributed to real estate agencies throughout the Detroit area, Betterton said.

All properties are tracked by the system from the time an offer is made until the sale is closed, which has improved relations with real estate agents, he added.

There are seven terminals (three CRTs and four teleprinters) hooked into ADP's Digital Equipment Corp. Decsystem-10, allowing information to be input immediately so the current status is always available.

Approximately 20 to 40 transactions are entered per day, according to Daniel Pence, ADP's HUD housing manager.

The system's effect on HUD's operation "is like coming from the 12th Century into the 20th," Betterton said. It has even improved employee morale by making the employees proud to work for the agency again, he said.

In order to encourage the public to do business with the housing agency, HUD is spending $150,000 on an advertising campaign tied directly to the system and the changes it has brought. "We want to let it be known that we can now provide responsible service to the public," Betterton said.

Other regional HUD offices have expressed an interest in the system and it is currently being implemented in the Chicago area, he added.

U.S. vs. AT&T Still in Limbo

WASHINGTON, D.C. – U.S. vs. AT&T is in limbo. As the government's antitrust suit against the telephone company approaches the second anniversary of its filing date, the U.S. District Court for the District of Columbia still isn't sure it can properly handle the massive case.

Judge Joseph C. Waddy, assigned the suit in 1974, has considered whether the Federal Communications Commission (FCC) might be the more appropriate body to hear the case.

This issue of jurisdiction, first raised by AT&T, also questions whether the antitrust suit should be declared moot because it covers the same ground as the similar suit settled with a consent decree in 1956.

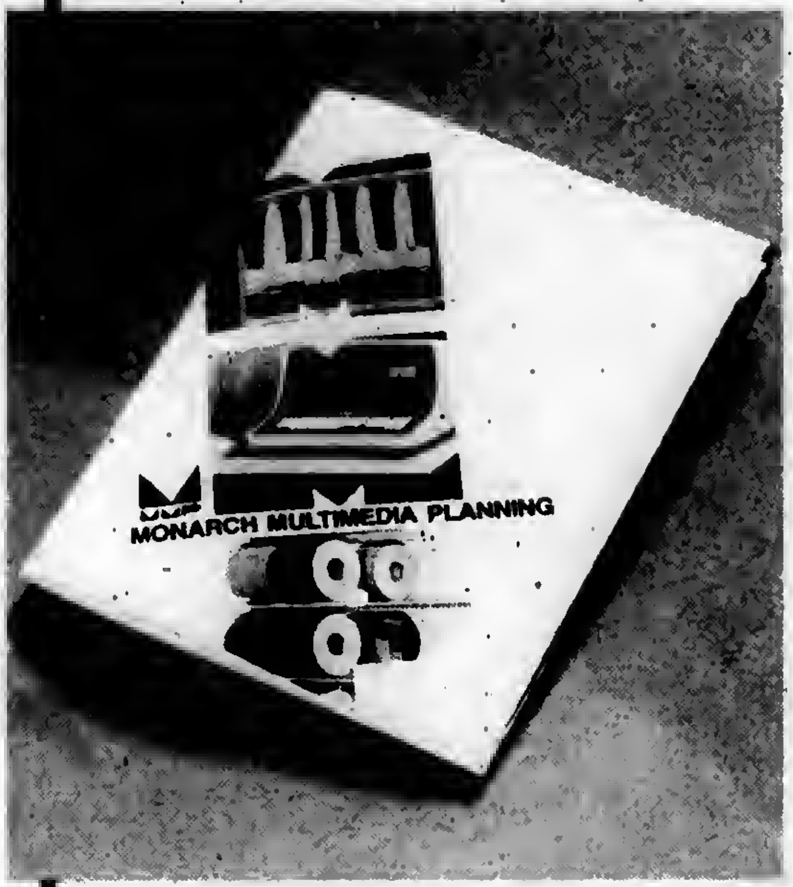
The only courtroom event scheduled is a Nov. 16 hearing on this question of jurisdiction.

Within a few months after U.S. vs. AT&T was filed on Nov. 29, 1974 and the government and Bell submitted their initial papers, Waddy brought up the question of jurisdiction and suspended all pretrial procedures. Both sides had to stop requests for documents and interviews with prospective witnesses, and these activities have remained dormant since the spring of 1975.

In a recent article comparing this suit with the government's antitrust action against IBM now on trial in New York, *Business Week* suggested Waddy would just as soon leave the case up in the air.

AT&T can use whatever delays it gets, *Business Week* also said, citing the telephone company's $1 billion in profits during this past quarter.

At that rate, Bell's annual $2 million legal bill is "only a small annoyance," the article stated.



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EFTS Charged With Posing Player Protection Problem

By Ann Dooley
Of the CW Staff

LAS VEGAS – "The problem with [electronic funds transfer systems (EFTS)] is that no one is quite sure what or whom should be protected," according to George Glaser, former president of the American Federation of Information Processing Societies (Afips).

Banks, credit unions, commercial enterprises and retailers are all players in the use of EFTS, Glaser said in a panel discussion here recently.

"One of the most important players in EFTS is the Federal government," Paul Armer, consultant, commented. "The Federal government shouldn't be considered a monolith. Some branches are fighting the constituency and, in some cases, fighting themselves," he said.

"Privacy legislation for the most part has been well intentioned, but not without fault. The problems involved in EFTS legislation will make the privacy issue look like an also-ran," Glaser said.

Key Concerns

Key areas affected by EFTS regulation are branch banking, already prohibited by 15 states, according to Glaser; privacy; uniform commercial code; and potential antitrust areas such as the sharing of a funds transfer facility.

Current state provisions are not conclusive enough because most states did not have EFTS when the legislation was passed and laws were, therefore, written from ignorance and speculation, according to Glaser.

Another major concern voiced by many critics about regulation on the federal level is that the government will become lodged in the program and will never be unloaded, he said.

"I see as the key issues of EFTS the role of the Federal government" and, on the other hand, "the amount of control and protection the consumer should be guaranteed," he said.

A Different View

David Huemer, speaking for National BankAmericard, had a different view.

"I believe the key issue in the EFTS controversy is a need for a more efficient method for transfer of money to replace the two tons of paper that is used daily now," he said.

"There should be some kind of regulation stipulating what information and under what circumstances it should be exchanged," according to Armer.

"Privacy: That's what freedom is all about. Any time a good deal of information is concentrated in one place, it constitutes a potential threat," Armer said.

In a non-EFTS environment, information is scattered and the cost of gathering and collecting that information is large, Armer explained.

"And as most financial transactions go on EFTS, not only what you buy, but what is even more important, where you are when you buy it could become documented.

"EFTS in an extreme case would be of great use to a would-be tyrant," Armer claimed. The privacy issue is not an absolute, he said. "You can't push privacy without hurting something else."

Software Attacked As Costly and Tardy

By Esther Surden
Of the CW Staff

SAN FRANCISCO – "What is software? Three things characterize it: No one understands it, it always costs too much and it's always late," according to Tom Sherrard of General Automation, Inc.

"The first step for the end user looking for application software is to define the problem; and that's where things usually go wrong. Programmers understand machines and users understand problems, but they can't talk to each other," he told attendees at a recent conference here.

Defining the problem should take about a third of the effort necessary to design the total system, he warned. Many people make the mistake of going through a quick problem, stating the procedure and later finding out they didn't really know what the problem was, he added.

Choosing the operating system comes next, although it is usually part of the hardware selection since operating systems are usually bundled, he indicated.

Language Selection

The next step should be choosing a high-level language for programming. "When minis first started out, your choice was simple," he told the group. "You chose Assembly language" because nothing else was available.

"It's slow, but it gives you complete control," he noted.

Higher level languages are chosen on the basis of the application to be performed, he said. For scientific applications, the typical language is Fortran, although Basic and Algol are also available. For commercial applications, RPG and Cobol are useful.

"A number of Fortran extensions are not just for scientific users, but are also for commercial users," Sherrard noted, adding Cobol recently became available on minis.

"You have to choose a language that suits your application, the code already on your system and the availability of the computer you've chosen."

Users should ask: How fast does the language run, how much space does it take up and how important is it to be able to move the code from one machine to another?

Once the user has chosen the language, he can generate his program, Sherrard said.

Several types of minicomputer operating systems are included with the system hardware to relieve users of certain tasks, manage system resources and take care of memory and peripherals.

The operating system should allow peripherals to operate in a way that assists the user in coding and gives him a degree of device independence. It should also support concurrent operations of peripherals, he added.

A batch system does a single job at a time and works that job through to completion. The problem with this type of operating system is that the CPU spends lots of time waiting for I/O devices, he said.

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Society Heads Disagree on How To Handle DP's Social Import

By Catherine Arnst
Of the CW Staff

LAS VEGAS – Little is being done about the social implications of data processing, five past and current presidents of professional DP societies agreed at a recent conference here – but that was almost all they could agree on.

Keith Uncapher, George Glaser and Paul Armer, all past presidents of the American Federation of Information Processing Societies (Afips), Herb Safford, past president of the Data Processing Management Association (DPMA), and Dr. H.R.J. Grosch, current president of the Association for Computing Machinery (ACM), gave their views on the extent of social problems in DP at a panel discussion.

Data processing will be the major scientific field of the future and there should be a simultaneous awareness of information processing as a national resource, according to Uncapher, director of the Institute for Information Sciences at the University of Southern California.

DPers "have done pretty poorly" in regard to the social implications of information processing, he said. He suggested encouraging professional society activities, supporting better practices and manuals and trying to imbed social needs into systems design.

But "the most likely thing we will do is stick our own heads in the sand and buy malpractice insurance," he said.

Nonfrustrating Machines

Besides the obvious social problems of privacy and security, Uncapher said the design of automated machines that do not frustrate the people who have to use them should be the major concern of DPers.

The real growth in the industry will come from "providing terminals for the non-DPer," he added. "We don't have a choice now in the design and implementation of systems for casual users," but "the driving force of profit" will make the computer industry direct its attention toward this social problem.

Grosch blamed lack of enthusiasm from the industry on the same market forces that Uncapher cited as the cure. In a capitalistic system, Grosch said, the only changes made are those that are profitable. "Free enterprise is guiding our opportunities," he contended.

Human control is lacking, Grosch said. "This is exemplified by the enormous vigor with which we push things, clearly to the detriment of our society."

Grosch put little faith in professional societies doing anything about social problems and believes the universities have abdicated their role.

The solution lies with DPers, he said. "Most of you are neutral – you are paid to do things, whether good or bad. You must put pressure on your bosses not to pay you to do outrageous things."

If the bosses are dishonest, DPers should either complain, quit or blow the whistle, depending on the degree of the dishonesty, he said.

Armer, a lecturer in computer sciences at Stanford University, agreed with Grosch that not much action on the social side of DP could be expected from the universities. The small number of programs on technology's impact on society that have been started "don't win any Brownie points" from university administrators and they are the first things to go in a financial crunch, he said.

A comprehensive information-processing policy should be developed in this country, he said.

"Caution is advisable in the social area," Glaser, an independent consultant, warned. "Social conscience is something of a luxury due to our relative affluence. Some of the socially conscious people are looking for something to be worried about."

If the government is involved in information processing, DP will be deluged with legislation that will have almost nothing to do with the problems, he said.

Glaser – and to some extent Grosch and Uncapher – seemed to support the position that the free enterprise system will take care of a lot of social problems in DP because the better products will eventually win out, although Grosch questioned whether a more profitable product is necessarily a better product.

Armer, however, did not agree with them. "Convenient and better products will only solve social problems when those problems are internal to market profitability," he said.

CPU Hastens Moonquake Data

CAMBRIDGE, Mass. – Computer modeling of the unique features of moonquakes has sent small tremors through scientific and academic communities.

After two years of simulating moonquake data, a team of MIT researchers here found moonquakes are caused by the gravitational attraction of the earth coupled with weak tectonic, or plate-shifting, forces.

Although Prof. M. Nafi Toksoz and two graduate students of the Department of Earth and Planetary Sciences monitored seismic signals from moonquakes for more than six years with no conclusive results, an IBM 370/168 produced the findings after simulating moonquake data for only two years, Toksoz said.

The signals, from a network of five seismometers placed on the moon by Apollo astronauts, were transmitted in the form of radio waves to the Johnson Space Center in Texas and loaded on magnetic tapes for shipment to MIT.

The IBM CPU and Datel Systems, Inc., IBM and Trendata Computer Systems Corp. CRTs and printer terminals are used in two areas: the analysis of moonquake data and a calculation of theoretical stresses, according to the researchers.

The computer models of the moon's interior revealed the moon's tidal forces from the pull of the earth are greatest at a depth of about 400 to 600 miles, where the moonquakes occur.

Furthermore, the monthly occurrence of moonquakes coincided with the time when the gravitational pull of the earth was strongest, the researchers found.

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Not Just CPU and Terminals

Distributed Processing Defined as Shared Control

By Toni Wiseman
Of the CW Staff

PHOENIX – Distributed processing does not refer to a large CPU with numerous intelligent terminals, nor does it specify several independent computers at remote sites, according to Bob Bartlett, manager of the Management Services Division of Touche Ross & Co.

Instead, the prerequisite for distributed processing is the shared control of data, he told a recent conference here.

Grosch's Law that power rises as a square of cost was true in the early '70s and may still be true today, Bartlett said, but the definitions are becoming more muddy and it is more difficult to measure true performance.

"If we have a rising complexity of our systems and a lack of understanding, we also have another trend – diminishing service to the user – to accomplish economies of scale," he added.

To combat the problem, many users have asked for their own minis to run their individual applications, but corporate people generally want to retain control of the total DP function, he noted.

"Today we are seeing a number of technological developments which will allow supplying DP power to the user while maintaining control within the corporate sphere of influence," Bartlett said.

Decreasing Cost of Memory

One element contributing to this change is the decrease in the cost of dynamic memory. Memory cost has come down a whole order and will probably decline another order by 1980, Bartlett predicted.

"The day will come when manufacturers will give memory away for free" and "the decision to acquire a system will focus on peripherals – terminals, printers and so forth," he said.

As a result of this hardware trend, a reverse trend has occurred in software. Software accounted for 20% of DP costs in 1960, but it accounts for some 70% today, Bartlett noted.

In terms of the overall DP budget pie, the largest slice is spent on people, the reverse of 20 years ago, and I/O devices account for more dollars than the CPU, he stated.

DPers not only need to have more accurate information on how they perform, but also need to be able to feed information back into the system to find ways of improving their productivity, he said.

As a result, more and more individuals are interacting with computers at their place of work through a terminal hooked into a CPU or through their own processors, often in a distributed network.

"Strangely enough, mainframe vendors are without exception making a commitment to distributed processing," he said, noting he was not sure whether this is a reaction to the market or whether it is occurring because the mainframers are planning to go into the mini area themselves.

Both IBM and NCR represent the leading edge of what retailers are doing in distributed processing. The IBM system architecture, for instance, depends on distributed intelligence in a centrally controlled network.

In the system, a 370 host controls a 370X front-end processor (a mini) which is in turn linked through Synchronous Data Link Control protocol to the 3650 retail system – in essence a minicomputer with full processing power, Bartlett said.

Under NCR's scheme, a Criterion is the host CPU and the 721 processors are stand-alone units that can function independently if other components in the network go down.

Additionally, NCR just announced the W2151 system, a software-driven retail terminal with up to 64K bytes of memory, he noted.

On the plus side, distributed processing is responsive to user needs in terms of on-line, real-time systems and accountability, Bartlett said.

The data base may also be distributed so that if the central location goes down, everyone doesn't lose his ability to function, he said.

But distributed processing will not eliminate existing DP problems, Bartlett believes. In fact, he said, it requires additional expertise in hardware and software.

In-House DPers Told To Stay Competitive

By a CW Staff Writer

LAS VEGAS – The in-house DP department is competing with service bureaus and the costs of projects should be competitive with outside sources if those on the DP staff want to keep their jobs, according to Ira Gottfried, a consultant.

One of the most serious failings of a corporate DP department is that after many years of experience, project deadlines still are not met, Gottfried told a recent conference here.

Taking into account vacations, sick days, training time and other nonwork time of the staff, project estimates should be based on a work week of three and a half days instead of five days.

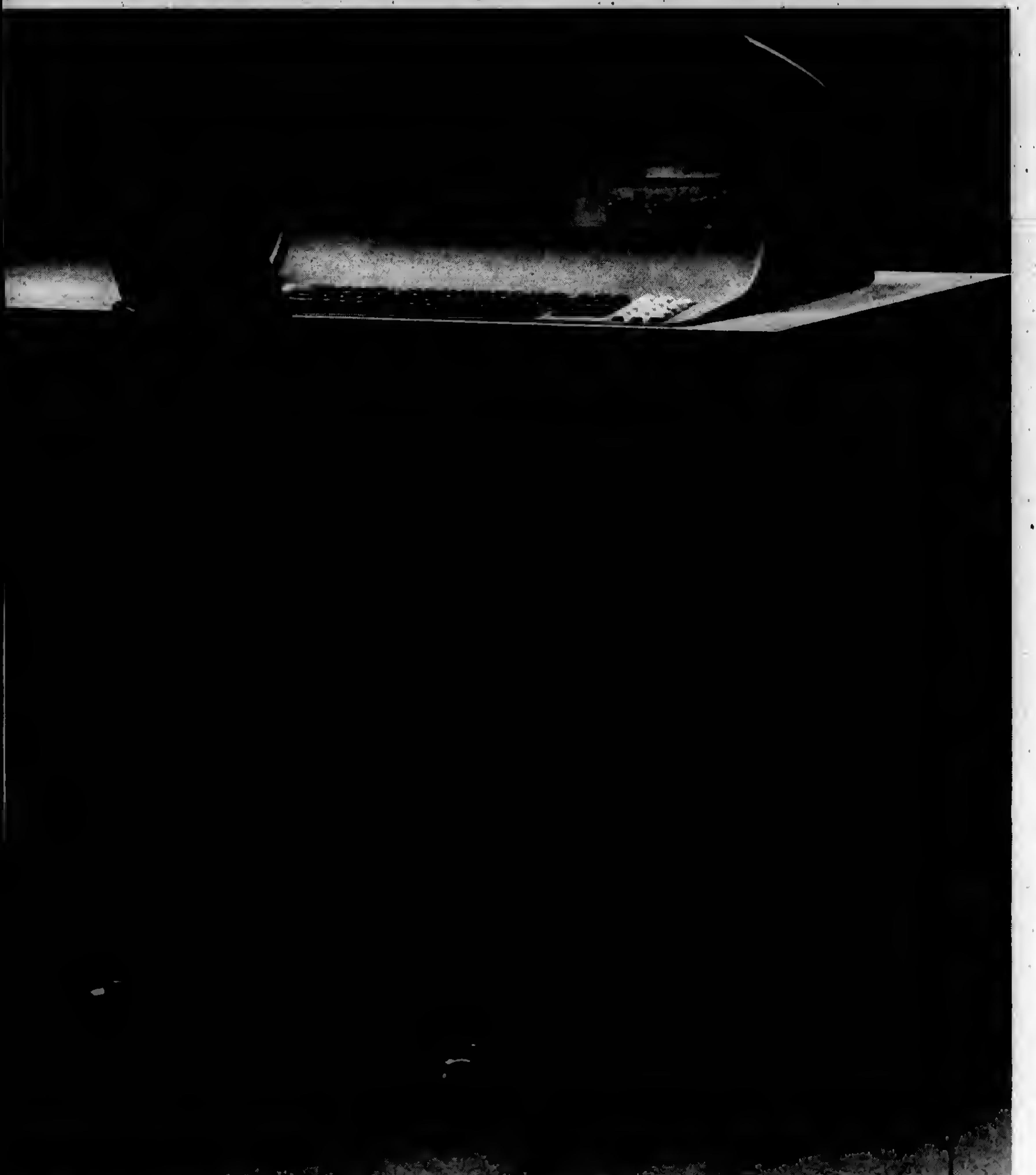
DP managers who estimate the completion of their projects based on this more realistic work week are finding jobs are being completed according to plan, he said.

In some cases, a project is actually completed on time, but it cannot be implemented until it has been approved by the members of management who have to review it, Gottfried said.

During the course of a project, enough points should be built into the schedule so the DP manager will know immediately when it starts to slip, he said.

In the area of cost, Gottfried advised users to carefully review the need for on-line applications. "Do people really need answers to their questions immediately or can they wait five minutes?" he said.

In one large company, 25% of the online jobs could have been batch jobs when the applications were studied in detail, he said.



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Use Seen as Major Factor

True Worth of MIS Measured by User Acceptance

By Toni Wiseman
Of the CW Staff

PHOENIX – The true measure of the worth of a management information system (MIS) is the acceptance it receives from its users, according to Anthony M. Joseph, director of retail consulting for Haskins & Sells.

"You can develop the most technically advanced MIS, incorporate dozens of exciting features and bring it up in an on-line mode for all to use. But if it isn't used, it isn't worth having," Joseph told attendees at a recent conference here.

As business becomes more complex, the retail manager, like his counterpart in other industries, has to place more and more reliance on his information system for the decisions he must make, Joseph said.

Decisions are made on three levels: top management or strategic; middle management or tactical; and lower management or operational, he noted.

Top management works principally in the strategical dimension, concerned with the future: image, expansion, organization, policies and goals.

This area of decision making is characterized by an abundance of qualitative, forward-looking data, most of which emanates from external sources, he noted. The past, more often than not, is irrelevant.

"We may reason," therefore, that "strategic decision making is not likely to benefit from the computer."

Studies of top management decision making bear this out, he said. Rather than exploiting the computer's potential, such as it is, management in this area tends to base its decisions on "soft" data speculation or hearsay.

And in its defense, he added, today's gossip could be tommorrow's fact.

Absence of 'Soft' Data

The absence of "soft" data from a computer's files is a serious limitation at the strategic decision level, but at the tactical and operational level it is far less so, Joseph said.

Even at lower levels of management, MIS implementation has been disappointing, he said.

The reason may be that management, following the maxim: start with what you have, has spun off the MIS from existing operational systems, he surmised.

"Unfortunately, what we had to start with wasn't always sound. Too often the basic transaction-oriented systems were unreliable, inaccurate and slow, and "when the MIS was eventually developed, it had all the same shortcomings," he said.

Narrower Scope Proposed

Joseph proposed narrowing the scope of what is expected from MIS. "As a concept, the total MIS may become discarded in time, if it hasn't been already. But the functional MIS is viable," he asserted.

A functional MIS serves a limited function. It is not all things to all people and, therefore, not generally a tool for top management.

But it does have a place at the two lower levels of management where tactical and operational decisions are made, he said.

At the tactical level, MIS may save many hours of tiresome and unrewarding work and allow the user to test the outcome of various conditions and decisions.

While the user could obtain these answers using hand methods, the computer approach has two things going for it that can't be matched: accuracy and speed, he said.

Operational MIS Limited

An operational MIS is even more limited, Joseph said, and is generally aimed at solving narrowly defined problems through optimization.

It accomplishes its goal, typically, by applying some fairly uncomplicated mathematical routines such as employee scheduling or basic stock replenishment, he added.

"Beside the 'strategical MIS' – the so-called 'total MIS,' – the 'functional MIS' may seem to pale into insignificance. Yet, it has something very much more in its favor: it can and is being made to work," he said.

Simple to Comprehend

It is simple to comprehend and operate; it addresses well-defined problems; and it does not need to access external data since it does not generally seek to create a corporate environment, he explained.

To the extent that it accesses external data, that data is quantifiable, not qualitative, he noted.

AMS Offers DPers A Home-Study Course

WILLOW GROVE, Pa. – A professional home-study course, "Records Management and Micrographics," is available from the Administrative Management Society (AMS).

The course is divided into four modules: general concepts, problems and techniques of records management; classification systems and manual filing; micrographics; and supplementary questions, problems and projects.

Learning Technique

Learning techniques used include immediate feedback to responses, concealed images and instantaneous referral. The course starts off with a pre-test questionnaire which enables the initiator to skip those parts with which he is already familiar: A posttest is included for checking progress.

The course is priced at $39.95 for members of AMS, the International Word Processing Association and the Office Microfilm Management Association; it costs $49.95 for nonmembers.

It can be obtained from AMS at Willow Grove, Pa. 19090.

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DPers Urged to Prepare for Future Shortages Now

By a CW Staff Writer

LAS VEGAS – Dwindling energy supplies and paper shortages will create hardships for DP installations, but there is a way out if DPers look at the alternatives and start making some choices now, attendees at a recent conference here were told.

There is no question the next four to five years are going to be bad ones in terms of energy, according to Dale Harmer, vice-president of customer services for Nevada Power.

Although such diverse energy sources as solar, wind, tidal and geothermal power are currently under study in the U.S., there will be no impact from them in the immediate future, he said.

For the next few years, Harmer recommended more strip mining, added incentives for gas and oil exploration, increased activity on the nuclear breeder reactor projects and the opening of nuclear power plants in spite of opposition from groups concerned with the safety of this form of power.

Admitting most of these recommendations are ecologically dangerous to a degree, Harmer justified his position with the stand that they are not as damaging as critics contend.

"We are choking on government regulations that prevent us from getting the energy we need," he said.

Harmer supported time-of-day meter reading as a valuable method of decreasing energy usage because people would pay cheaper rates during nonpeak hours. "I hope that out of DP will come the expertise to do time-of-day reading."

Another suggestion he made was that companies build their own generating plants and take the load off public utilities.

Paper is another shortage that DP is already facing, and the only way to cope with the high cost and unavailability of that commodity is to avoid using it as much as possible, according to Ken Duffy, district sales manager of Data Documents, Inc.

He attributed the rapid growth of computer output microfilm to the paper shortage and suggested "even magnetic tape will be passe in the next 15 years." Microfilm cassettes will save 60% of the paper now being used in DP shops, he said.

The first thing to go in most DP installations during a paper shortage is tab cards, Duffy said. In 1974, 400,000 tons of tab cards were used; that amount will dwindle to 260,000 this year, he predicted.

Bond paper, the next to go, usually follows the trend in tab cards by two to five months, he said.

Other developments in DP that will reduce the need for paper are electronic funds transfer, which will replace 75% of the checks being used by 1985, and the nonimpact printer, he said.

Even if the use of paper decreases, the price will not drop, Duffy warned, because most of the price increase is coming from paper converters, which is not a very competitive market.

"The future is promising" in spite of paper shortages, he said. "We're merely scratching the surface now" in terms of solutions, he concluded.

'Portfolio Overview' Suggested

Type of MIS Implementation Plan Seen Crucial

By Catherine Arnst
Of the CW Staff

LAS VEGAS – It's generally accepted that a plan must be developed for a management information system (MIS); but the difficult decision is determining what type of plan should be made, according to John V. Soden of McKinsey and Co., Inc.

"There are a lot of different ways to identify systems planning," Soden told a recent conference here. "The trick is to figure out what approach is right for your organization."

He labeled different types of plans as "squeaky wheels," or reactive; "straight-edged," where every detail is planned beforehand; "ivory tower," where the plan is developed away from the installation; "silver platter," where planners work with users but do all the analysis on their own; "conceptual smorgasbord," where a little bit of everything is presented in the plan; and "tinker toy," which Soden described as a data base architect's tour.

"I'm not overly enthusiastic over any of these," he said, and went on to describe what he called a strategic plan for MIS. The best way to begin, he suggested, is to list all projects under development funded and under consideration by the company implementing an MIS.

This creates a project portfolio overview, Soden explained.

Steering Committee's Challenge

A steering committee should then be selected with representatives from all departments that would be touched by the MIS. The pitfalls to be avoided in creating a steering committee are premature establishment, wrong charter, wrong members, wrong spokespeople, poor staff support, poor across-the-board communications, a technical smoke screen, fuzzy feedback and unnecessary meetings, he said.

The key challenge of this steering committee should be to determine company projects and rank them by priority, he continued. The next job is to start operational planning which has effectiveness and efficiency targets built into it.

Some planning guidelines Soden suggested included recognizing need, admitting paperwork isn't a plan, reviewing business and MIS planning literature, proposing MIS objectives, policies and strategies before planning, linking into an overall business plan, planning how to make nearer term decisions, making the company's plan for computing use and emphasizing need-driven rather than technology-driven decisions.

A company must recognize MIS technology is a working tool, not an objective, and work from that principle, he said.

An MIS strategic statement should also be made at the beginning of any plan which determines whether a company wants to do long-range or short-range operational planning, he emphasized.

The problem with most strategic planning is that it is poor in facing and assessing competitive threats, Soden added.

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Editorials

Limiting Access

Recent disclosures that investigators for insurance firms were able to routinely get information from the Federal Bureau of Investigation's (FBI) computerized criminal files [CW, Nov. 1] once again point to weaknesses in that system.

In this case, as in most, people were the weak link in the system. Terminal operators in police departments routinely answered requests for information from individuals they thought were from another police agency.

This is understandable, since the FBI apparently does not prohibit this type of access and police officers are normally inclined to help people they think are fellow officers.

No matter how many passwords or secure terminals are used, it will always be easy to beat the system as it stands.

However, access could be controlled much more effectively. Except for emergency calls from patrolmen on a beat or in a squad car, no information garnered from the FBI or state criminal systems should be released over the phone. It could be sent to the precinct house that needs it by messenger or even through the mails.

That way at least it would go to a precinct house and not to a private company that just called in and said it was a police station.

The case also raised another point. The FBI's system contains information on people who have been arrested for crimes but never convicted — people who are completely innocent in the eyes of the law.

Such information can be potentially damaging or at least embarrassing to the individuals involved.

There is no legitimate reason for keeping such information in centralized computer files; in fact, there is absolutely no legitimate reason for keeping such information in any form.

Our system is based on the concept an individual is innocent until proven guilty. Keeping files on those arrested without ever being convicted of a crime equates guilt with arrest.

This is wrong. The FBI and all police agencies should purge their files of any such records — particularly since they have constantly proven they cannot keep those files secure and out of the hands of private interests.

Mini Users Take Giant Step

The dream that minicomputer users would come together to thrash out common problems and set standards in an industry with a proliferation of systems, peripherals, languages and interface alternatives took its first step toward becoming a reality at the Mini/Micro Conference and Exposition held in San Francisco recently.

The questions raised in the sessions showed user frustration. Users asked: Why can't we learn how to maintain our own systems? Why isn't maintenance easier? Why is it so difficult to interface an independent's peripheral to our CPUs? Where are the interface and media standards we need?

Users at the conference took the first step by asking these questions, but the second step — getting users and vendors together to answer those questions — has yet to take place.

This should be the task of the Minicomputer Industry National Interchange (Mini) organization. It's time users and vendors begin working together to develop standards for products and services so progress rather than frustration can be reported at next year's Mini/Micro Conference.

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'Brother, Can You Spare a Microsecond?'

Letters to the Editor

Political Endorsements Have No Place in Computerworld

Thank God at last! This is the only comment I can offer after discovering that "A Time for Change" by Herb Grosch [CW, Oct. 25] was the final appearance of the Black Hat/White Hat column.

This very offensive, political article read as an endorsement for one political candidate over another and had no place in "The Newsweekly for the Computer Community." If this globe-trotting, name-dropping, hates-to-mingle-with-the-common-folks egotist wants to endorse a political candidate, let him pay for an ad.

I find it very offensive to have to pay for a subscription to a newspaper that is supposed to serve a certain segment of our society and have to read this individual's personal comments about a topic that does not belong in this type of a publication.

N.A. Vittore

Des Plaines, Ind.

Carter Not the Messiah

I noted the Oct. 25 edition of *Computerworld* carried the final appearance of Herb Grosch's Black Hat/White Hat column. Congratulations! I have been in the computer business for 26 years and have listened to and read this clown's views for almost as long.

This egocentric does not speak for me nor any other person I know in the computer business, and I can't imagine how you have stood him this long.

He's an insult to the computer profession and I hope he is no longer in a position to downgrade your otherwise excellent publication.

Morgan W. Huff

Nashville, Tenn.

Glad to See Him Go

I must strongly protest Herb Grosch's political column. Grosch appeared to be in ecstasy at the prospect of the election of Jimmy Carter.

Carter is not the messiah — just another politician stamped out of the typical big government, hang-the-expense, buy-your-vote mold of a succession of Democratic candidates.

Political endorsements have no place in *Computerworld*. You should send a bill for that column to the Democratic National Committee.

W.R. Weimar

Houston, Texas

Additional Views Ignored

"Report Raps Agencies for Wasting Millions With Poor DP Policy" [CW, Oct. 18] gave a very shallow review of the House Government Operations Committee report about "mismanagement" in government purchase and use of computers.

The article failed to cover the fact that in the same committee report there were "additional views" added by Rep. William A. Steiger (R-Wis.).

The basic committee report was intellectually shallow. It seemed quite like the popular election-year gambit of alleging government waste without examining the causes.

On the other hand, Steiger's remarks constructively suggested improvements.

The contrast between his constructive remarks and the basically negative (and not entirely accurate) remarks of the report should have been, in some sense of fairness, at least mentioned in your converage.

Henry J. Juenemann

Washington, D.C.

Data Past

Five Years Ago
Nov. 10, 1971

CHICAGO — Trans Union Systems Corp. was the first user of an MCI Communications common-carrier microwave circuit and was expected to save more than 40% per month over the use of Bell private lines between Chicago and St. Louis. The MCI switch-over climaxed more than seven years of regulatory proceedings and intensive negotiations with established common carriers.

– – –

NEW YORK — RCA was sued for $110 million by Marketime Corp., a lessor of RCA computers and an RCA user by virtue of its service bureau operation, for alleged damages arising from its departure from the computer business. The complaint contended the value of RCA equipment owned by Marketime had been reduced in value by RCA's decision to exit from the business.

Eight Years Ago
Nov. 6, 1968

ATLANTIC CITY — IBM introduced a series of USA Standard Cobol compilers for delivery within the year. The announcement included details of language conversion programs designed to provide 95% conversion from the 360 Cobol compilers; it also included manuals which differentiated between language facilities in the USA Standard Cobol and IBM extensions.

– – –

WHITE PLAINS, N.Y. — IBM withdrew both increases and reductions in maintenance charges announced the previous week because many leasing companies entered into fixed price contracts which included maintenance. IBM explained it was not aware of the terms of these contracts because they were between the leasing companies and their customers.

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Frustrating Forces Prompt Programmer's Paranoia

By Miles Benson

Special to Computerworld

The Sociology of Computing

Programmers are a paranoid lot.

But look at all the forces seemingly out to get them.

There's the computer, ever-lurking and ready to drop a bit at a critical moment.

There's turnaround, which by definition is always inadequate and the prime cause of missed schedules.

There's the job control language, which can be counted on to blow otherwise perfect computer runs at least once.

And there's computer operations, which loses or mutilates program decks which haven't suffered one or more of the above maladies.

Did you ever work on one of those programs where just about everything which could go wrong did?

Well, Rodney Goodenough did. The experience was almost more than he could bear.

It all started innocently enough. When the last 7.3 Richter scale shakeup of personnel happened at Wings Aloft Aviation, Rodney found himself thrust into the software reliability section of Wings Aloft's DP department.

He replaced Cassandra Slimwear, who had been working with a Simplified Proof of Correctness (Spoc) program obtained from the National Software Works before the shakeup had sent her spinning out into the 7DC7 airplane port landing gear application area.

Cassandra, Rodney soon learned, had done a good job of converting Spoc from the esoteric Quadranova computer it had been implemented on to the more workaday Marketronics PI used by Wings Aloft.

He stepped lithely (and symbolically) into Cassandra's size 5 go-aheads and began to experiment with the usefulness of Spoc in the Wings Aloft world.

It was when Courtney Sprinkle, a programmer in Wings Aloft's Starboard Structures group, discovered Spoc failed to process an obscure feature of the Marketronics computer PL/PI language capability that Rodney began to get his first clues that Spoc was a troubled piece of software.

In order to expand Spoc to incorporate the missing capability, he needed the source program. Well, it was on a time-sharing private file on the Wings Aloft central computing facility, he was told. Or rather, it had been, he soon learned.

Management, during the Cassandra-to-Rodney transition period, had failed to realize that time-sharing data sets which are not paid for are lost. Or rather, it had realized that.

It just hadn't realized the significance of the time-sharing file which it elected to discontinue supporting when the next file-charge sheet came around with Cassandra's name attached to something cryptically called "Spoc SRC." Spoc's source code, unfortunately, had disappeared into that giant bit bucket in the sky.

Or had it? There was a chance, Cassandra told the panic-stricken Rodney when he called, that a salvage operation could be performed. Wings Aloft kept backup files on all time-sharing data sets, she said.

Rodney was in luck. The backup file did still exist and Spoc's source program was restored to its former robust health. It was to be the last piece of good luck in Spoc's history for several months.

The JCS Plague

For those of you who aren't familiar with the job control structure (JCS) on the Marketronics computer, a parenthetic word of explanation is in order here. Rodney had been programming on a Minimax E-Squared minicomputer for so long, he had forgotten JCS existed.

JCS is a plague that swept the computing industry in the second decade of its commercial existence, felling towering technologists right and left in its rush toward the promised land of versatility. JCS is a thorn in the foot of the lions of industry, so far down at the bottom of their hierarchic structure that they scarcely feel the persistent pain.

JCS is a language that was designed to solve all of the computing world's problems, then prematurely frozen to a set of unfortunate specifications. JCS probably wastes more computer and people time than any other single cause. Naturally, Marketronics is proud of it.

But to Rodney, JCS was the personified Second Coming of tragedy to Spoc. In his zeal to rehabilitate Spoc, he elected to move it to another computing installation within Wings Aloft where some eager experimenters were waiting to use it.

Not only was JCS a roadblock to this goal in and of itself, but JCS differences between the "compatible" installations also plague the frustrated Rodney.

Days, then weeks, slipped away, with no visible progress in making Spoc available to its waiting users. He overrode proc parameters erroneously, made up data set names with the wrong number of characters, used the wrong card columns, put blanks in all the worst places, omitted region sizes and time maxima and, in short, fell through every possible loophole known to JCS users.

All of that was only a prelude to the major calamity which followed. Rodney, his confidence chipped away by the omnipresent JCS, made one of the classic blunders of computerdom.

In order to make a minor change, he tried to copy from the disk data set, which was the Spoc source restored from its earlier loss, onto a backup tape which contained the only existing duplicate of Spoc.

But the disk data set had been clobbered by an accounting system error and the now-worthless disk data erased the only backup.

Spoc, in a word, had been destroyed.

Now those of you who are familiar with computing down at the bilge-pump and bowel control level know there is always a way out of this kind of dilemma. You keypunch from the listing, right? Everybody talks about it, but nobody really has to do it.

Rodney had to do it. Laboriously, column by column, line by line, card by card, keypunch error by keypunch error, life was breathed one more time into the twice-moribund Spoc. The perspiration stood ankle deep in the keypunch room the day he finished. But he did finish.

Climax and Anticlimax

The climax of my story has been reached. Spoc's second rebirth was a success, eventually, although there was the usual collection of machine errors and crumpled decks and JCS problems along the way. But by way of anticlimax, one more significant event happened to Rodney and Spoc which somehow symbolizes the whole saga.

Twice burned, Rodney punched out the source images of Spoc and kept them in a cabinet near his desk. No more risk of losing all in the uncontrollable world of computerized data sets, he reasoned. Which, of course, was correct.

However, Rodney failed to reckon with human clumsiness . . .

One day, while passing by Rodney's desk on the way back from the coffee machine, Letitia Caffein inadvertently stubbed her toe on a bit of computing flotsam which barred her stride. The coffee from her cup arched high in the air and came down with a brown splash on the nearest object at hand.

Which was, of course, the Spoc card deck. Brown stained down to the fours row. Soaked to the nines. Rivers formed momentarily in adjacent card holes.

Letitia was aghast. Not just at the impact on the deck.

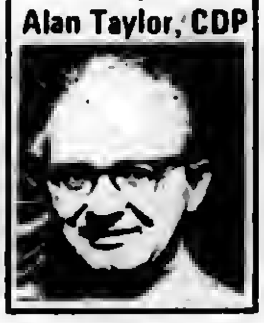
What really got to her was Rodney Goodenough's hysterical laughter. Now why would a perfectly sane programmer behave like that?

Argument for Check Digit Standard Confusing

The Taylor Report

By

Alan Taylor, CDP



One of the considerations that arose during the check digit discussion was whether a standard method for the preparation of check digits was appropriate.

The most formal statement in support of standards came from the May 26 report of the Statistiska Centralbyran of Stockholm, "A New Check Digit Computation Method Report" by H. Block and others. The paper discussed a variant of the Deeds method and the authors commented they wanted the system to be more widely known, implemented in new systems and adopted as a Swedish standard.

The authors briefly considered the objections to the adoption of the method, or any single method, as a standard. The disadvantage they noted was that this would inhibit people from having their own secret methods of providing check digits.

Looking into the future, they saw the possibility of computations being performed, in many cases, on minicomputers with terminals that have limited possibilities for programming and program storage – and, in some cases, computations being performed on punching equipment.

"Too many methods would make such equipment more costly. We need a standard and we will have the best method as standard . . . We think that [having a standard method] is far more important and that everybody should have his own secret check digit," the authors said. It is a good point that has to be faced.

The authors did not attack some of the necessary groundwork before reaching their conclusions. What are the advantages of some people having nonstandard check digit methods? Does a "standard" have to be an exclusive standard? Does the additional cost relate to systems which have to be geared to multiple uses?

The basic Block argument stated small equipment will be more costly if it must be able to handle more than one checking system. Therefore, because such small equipment can be expected to be required to handle more than one functional system, the interests of those who might want a secret checking system are of lesser importance.

Put this way, one can see the equation is missing some basic data. Just how important are the interests of those who want to have a secret checking system? Block assumed some unstated level of importance, but simply did not come to grips with the question.

Secrecy Needs

Yet, it is almost right there, lying on the surface of his own paper. Block just assumed people who do not want standard check digits will want secret ones. The assumption was never stated.

People who oppose standards might want the latest methods which provide better protection for any numbers. They might want one which provides particular protection against the particular set of numbers with which they are most concerned. Or they might want to have protection tuned to the physical connections and known circuit problems that cause nonrandom error.

All of these people might want other check digits rather than some standard one. The standard one might well be best under random circumstances, but there will probably be one better able to handle specific systems.

A system which includes a person's birth date (as do many Scandinavian identifiers) or a system which identifies banks, bank branches and facility types (as do many credit cards), would be absurd examples. In both of these widely spread instances, the assumption that random data is used in selecting the best method is simply invalid.

Birth dates have 1 and 9 next to each other very frequently and have many more 0, 1 and 2 digits than random consideration would expect. Bank numbers also are unbalanced with the 0s and 1s coming up to the top way beyond random consideration. So the whole basis of selecting the "best" check digits may be inapplicable to these systems as far as having a high percentage of caught errors goes.

Yet, Block ignored this group. Instead he referred to people having secret check digits. But, people don't want secrecy just to help accuracy. If accuracy is all that is desired so that what goes into a system also comes out at the other end, then secrecy is neither here nor there. Secrecy is a totally different requirement for accuracy.

Secrecy is a security precaution. Secrecy assumes that for some reason some unauthorized use of the system can be expected to be attempted. The check of a secret check digit system is to trap anyone trying to provide false information. At the most, inaccurate data transmission collection is simply a by-product.

In fact, the very person who wants to effectively forge some identification would be just as much interested in getting perfect transmission of his forged data as the man in charge of the DP system would be in getting correct transmission of all his data. So far as accuracy considerations go, the interests of the forger and the system are identical.

However, there are systems which will collapse if open to forged transmissions. Others will fall into reduced use.

The use of a standard, a well-known method in such circumstances, is like telling the forger the combination to the safe on the grounds it is cheaper to build all combination locks with the same combination.

Before this loose thinking gets very far, everyone should realize that distinctly different and valid requirements for accurate transmission and entry and avoidance of forged data are both protected by check digit systems.

Any consideration of check digit standards must understand their independent existence. Their values cannot be traded off against each other at standard level, as Block seemed to want us to do. And their confusion of accuracy and safety, even in technical minds, can easily result in worthwhile standards being lost or dangerous standards being accepted.

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Reader Commentary

Storage of Date Information Lacks Inventiveness

By David Schechter
Special to Computerworld

The storing of date information in DP systems is an area which has shown little inventiveness as analysts and programmers continue to stress human readability of this information to ease arithmetic manipulation.

Most often dates are stored in "Gregorian" format: i.e., month/day/year. For example, Sept. 2, 1976 would be stored at 09/02/76. (Note the century designation is dropped in the interest of conserving space).

Sometimes Gregorian dates are stored in year/month/day order to facilitate comparisons of one date to another for purposes of determining which is the earlier of two dates.

Because the number of days from one month to another varies, it is impossible to obtain the number of days elapsed between two dates by simple subtraction when these dates occur in different months of the same year.

For this reason, perhaps, one often finds "Julian" dates being employed for internal storage in DP systems. Julian dates are stored in the formal year/day-within-year. Thus, Sept. 2, 1976 would be stored as 76/246.

This format enables the elapsed days between any two dates in the same year to be obtained by simple subtraction. However, it is often necessary (as in developing age-open receivables) to subtract one date from another across year boundaries. Julian dates do not facilitate this.

FDN Method

A better method of representing dates internally is simply to represent all dates as the number of days elapsed from an arbitrary base date. Dec. 31, 1899 suggests itself as a practical base date because a simple formula can be used to convert any Julian date to the number of days elapsed since that date.

There are a fixed number of days in a century, namely 36,500 plus 25 leap-year days. Thus, any date between Jan. 1, 1900 to Dec. 31, 1999 can be expressed as a five-digit number (FDN).

A formula which converts Julian dates (YY/DDD) to a FDN is as follows:

$$FDN = (YY * 365.25) - .25 + DDD$$

Using the example of Sept. 2, 1976 (76/246) in Julian date format' this would convert as follows:

$$FDN = (76 * 365.25) - .25 + 246 = 27759 - .25 + 246 = 28004.75$$

$$FDN = 28004$$

The formula to convert a FDN to a Julian date is only slightly more complicated because two separate results must be ascertained: YY and DDD.

$$YY = FDN/365.25$$

$$DDD = FDN - \text{Integer}((YY * 365.25) - .25)$$

Applying these formulas to our illustration:

$$YY = 28004/365.25 = 76.67 = 76$$

$$DDD = 28004 - \text{Integer}(27759 - .25) = 28004 - 27758 - 246$$

Simple Subtraction Required

If all dates are stored internally as FDNs, then only simple subtraction is needed to determine the number of days elapsed between any two dates in the 1900s. Conversion to Julian or Gregorian format would be undertaken only when these dates need be displayed in human readable form.

Furthermore, in any system such as the IBM 370 which uses 8-bit bytes and provides binary arithmetic operations, FDNs can be compressed into 16 bits (two bytes) rather comfortably. The maximum FDN in base 10 is 36525; in base 16, this FDN would be stored as 8EAD.

Wherever dates are to enter into calculations for aging purposes or it is desired to store date information in compressed form, the use of the FDN is recommended over either Gregorian or Julian date formats.

Not only does this enable the number of dates between any two dates to be computed easily, but even the day of the week corresponding to any FDN can easily be determined by obtaining the modulus 7 of the FDN.

Since Dec. 31, 1988 was a Sunday and the modulus 7 of 28004 is 4, we know that Step. 2, 1976 coincides with the fourth day of the week following Sunday, namely Thursday.

The FDN is not only a useful method of storing dates, but has many practical consequences as well.

Schechter is a DP specialist in the Management Services Department of Arthur Young & Co., New York.

DP Design Breakthroughs Long Overdue

By D. Jack Bridges
Of the CW Staff

I concur with Alex d'Agapeyeff, who told the 1976 European Computing Congress "most of the time [programmers] have been doing the wrong task on the wrong equipment in the wrong way" [CW, Sept. 20].

Use of a general-purpose computer for many specialized applications is analgous to an attempt to modify a land vehicle for use in the air, sea or outer space. If it makes sense to modify a computer with mountains of software, why hasn't anyone thought of attaching wings (and wings . . .) to an automobile until it can fly?

Also, how many people prefer time-sharing a Cadillac to owning their own Volkswagen?

I doubt the inventors of the stored-program concept ever dreamed it would be applied nearly blindly for 30 years with a stagnation of truly innovative design changes or improvements.

Hardware has been improved principally by speed and miniaturization; software has been improved principally by putting more and more of it (high-level languages, operating systems, etc.) between the problem solution and the hardware.

Externally, it may be impressive for a novice user to obtain "almost immediate" results by the flick of a light pen or the touch of a button on his console, but are all those thousands of hidden instructions really necessary?

In many cases, it would be simpler if the button merely activated the proper response directly with the hardware.

Additional breakthroughs in computer design are long overdue. Perhaps we should be seeking some kind of modularized hardware packages that can be combined with standardized modular software aids by a problem-solving expert in each area of application.

Concievably, software as we now know it could disappear completely.

There have been many small steps taken in the right direction by new computer companies. Unfortunately, the nature of the competitive market too often stifles many of the promising ideas. Many universities do not even seem to be aware of the basic problem.

Minicomputers and microcomputers are a significant step forward, but this is still just putting old ideas in smaller packages and adding speed.

What we may need is a new breakthrough in computer/application/hardware/software design. How about it, IBM?

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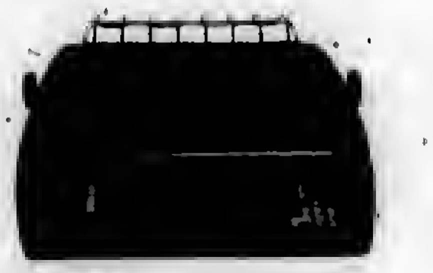
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Standards Could Be Solution to Systems Design Lag

By Thomas A. D'Auria
Special to Computerworld

Harold Worrall's recent article regarding the systems development lag [CW, Oct. 4] omitted a major solution to the problem of cost overruns and poor management control – the standard.

Many DP installations do not have any standards for design, documentation or programming. Yet good standards enable the installation's management to better estimate overall project costs, project deadlines and implementation. They force a user-oriented and tested system.

I am not advocating the institution of a general standard for all DP installations. As we all know, each installation has its own environment which must be considered prior to the implementation of any standard.

Every user of a standard must be consulted or must take an active part in its development. No standard imposed from above will survive. Anyone who is expected to adhere to a standard must be able to see its necessity and help to develop something that is workable.

A major insurance company in New York was developing standards for in-house use. After much investigation, it found a large West Coast bank had a set of standards which had been in use for five years. The set was kept current. It was accepted by the staff and it had the full support of management.

Reader Commentary

The insurance company decided to use the bank's standards at its installation because of the bank's success. The insurance company also felt this would eliminate the trouble of "reinventing the wheel."

Everyone in the shop was issued the new *Company Documentation Standard Procedure Manual.* Everyone "agreed" standards were a good idea and it was about time they were in use. Management vowed to enforce them all the way.

Deadline Slipped

New projects began using the standards and past systems were reviewed for possible inclusion. Then a deadline slipped. The users wanted the system immediately. The programming group estimated the entire effort would take an additional three weeks using the standards and one week without.

Management decided it could not wait for the standard documentation to be completed. It told the programmers to proceed without the documentation. The comment was made that "once the programming is completed, we can always return to the documentation."

Needless to say, management never returned to the documentation, but the standards continued to be followed in other areas.

Then a manager from the user department wanted a "small mod" made to a production accounting program. The maintenance group did it as a "favor" for this manager.

Code 'Slipped In'

The required modification documentation was not produced. The revised code was "slipped in." And so it went.

The company had invested much time and effort in obtaining these standards, printing the manuals and distributing the books. Unfortunately, there were no major management commitments, no employee understanding of the need for maintaining the standards and no mechanisms for the granting of exceptions.

Within one year, the insurance company's effort was nonexistent. Today, the manual is two years out of date and people are saying how helpful it would be to have standards.

Adaptation Problem

The problem in this case was attempting to impose someone else's standard without adaptation. Neither management nor staff understood why many of the standards were necessary.

Many of the standards applied well in the original bank. The insurance company was organized differently.

Members of the staff were being asked to produce documentation that no one needed. Inevitably, they let this work slip until the last minute. There was always something more important to do.

It reached the point where the choice had to be made between the deadline and the standard. As in most cases, the choice was to abandon the standard.

D'Auria is vice-president of Sysdoc, Inc. in New York.

'VSERV' Cuts Disk Space Waste

A tool for identifying wasted disk space and allowing more efficient space allocation in IBM DOS or DOS/VS environments, Vserv is a "volume table of contents (Vtoc) service utility" available from Occidental Computer Systems, Inc. (OCS).

Vserv solves the disk management problems encountered in most DOS and DOS/VS installations by providing management with a comprehensive device mapping facility and Vtoc access capabilities.

Vtoc manipulation commands supported by Vserv allow the user to graphically display a pack map and create, delete, update or rename a Format-1 label for a file.

THe ability to truncate one or more files to the last used track is also part of the package. These Vserv options allow management to take direct action to solve underutilized space and overallocated file problems.

Vserv is provided with a Genserv macro that allows the user to tailor his Vserv operation to defaults and security checking. Security checking is through the UPSI or SYSPARM fields of the supervisor and provides safety against unauthorized use of the commands.

Vserv consists of a 18K program and a B transient. Vserv reads the Vtoc, sorts it in core and prints the pack map; this shows free spaces and provides a pack usage summary, displays end-of-file addresses, recognizes system files and libraries and flags data secured and expired files.

Vserv is available on a 30-day free trial. The user guide is self-generated by the Genserv macro and the system is provided on magnetic tape.

Vserv is available for a one-time purchase price of $400. Occidental Computer Systems, Inc., 10202 Riverside Drive, No. Hollywood, Calif. 91602.

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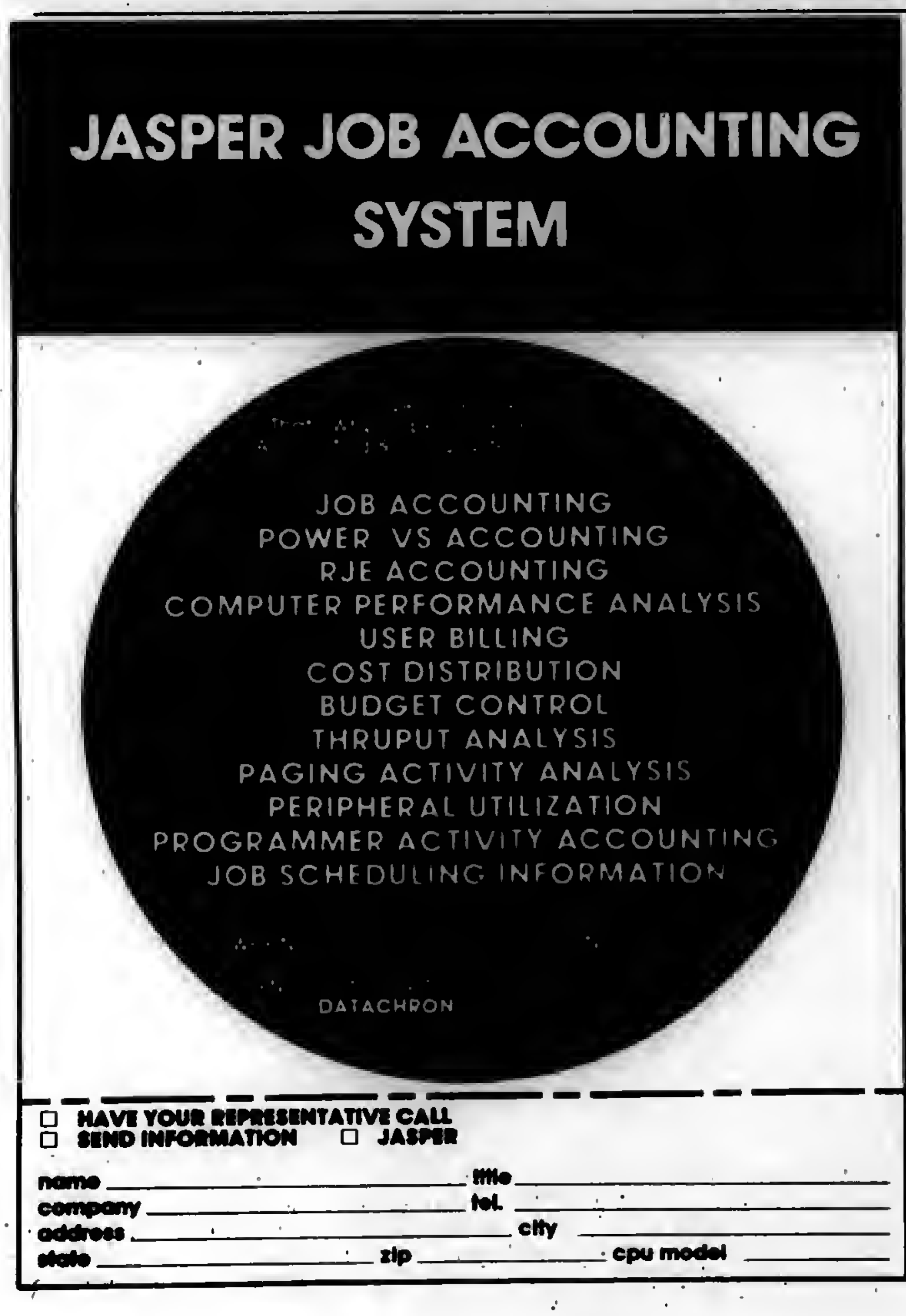

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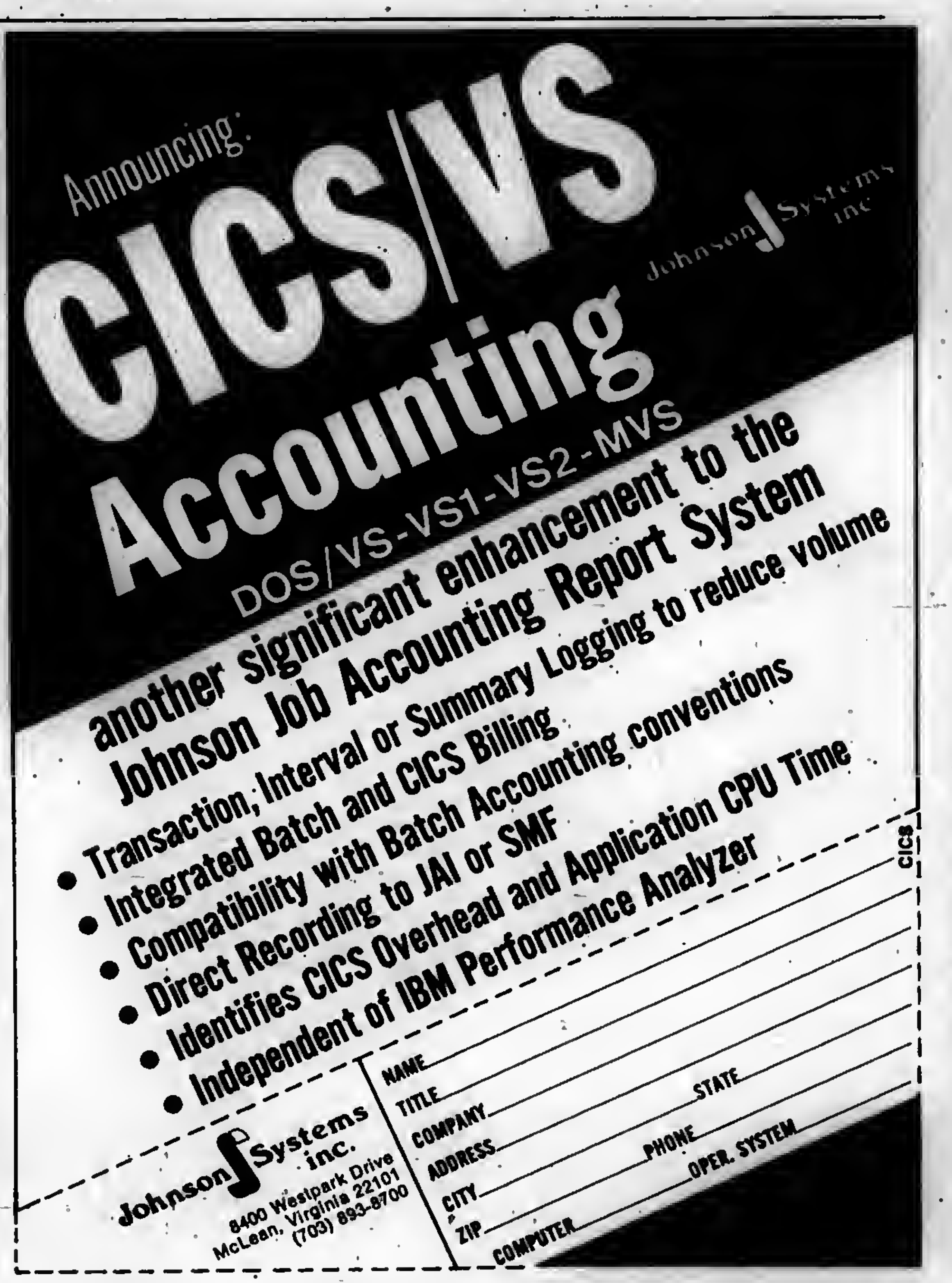

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'Task/Master II' Backs 'Totally Decentralized' Net

NORWALK, Conn. – The Task/Master II package introduced last week by Turnkey Systems, Inc. (TSI) is said to provide a three-pronged attack on telecommunications problems faced by IBM 360/370 sites.

The most notable of the package's capabilities, according to a TSI spokesman, is support for a "totally decentralized" network of processors. Task/Master II can operate in a host processor, a locally attached front-end unit or a remote satellite processor, he said.

With host-to-satellite and satellite-to-host modules handling all the basic communications chores, user application programs can be written without regard to where data may actually be stored, "thus allowing work to be performed at every level and against truly distributed data bases," the spokesman added.

Task/Master II also includes a message management facility which is said to eliminate all programming normally involved in creating display screens and editing data coming in from IBM 3270 or compatible terminals, he said.

A data entry capability built into the package allows on-line collection of keyed data without programming. This feature permits interactive validation of data at either a host or a satellite processor, including verification of data against centralized or distributed data bases, TSI claimed.

Existing Facilities Expanded

Existing Task/Master facilities have also been expanded, according to the company. Restart and recovery capabilities, for example, have been extended to include restart coordination between programs, the data base(s) and the network – "regardless of the severity of the failure and without programming effort," the spokesman said.

TSI has extended both the terminals and the data base management systems supported by Task/Master. The updated version includes support for "all Synchronous Data Link Control (SDLC) devices in native mode" as well as many other recently announced terminals.

Task/Master II is said to interface with "all commercial data base systems" and, although TSI "would suggest Task/Master as the communications control task in the host," the host-to-satellite module can support IBM's Information Management System (IMS), Customer Information Control System (CICS), Time Sharing Option (TSO) or other systems in the main processor, the spokesman claimed.

An administrative control capability, offered as a system option, includes a high-level command language for routing messages and controlling the network from any terminal. All messages forwarded through Task/Master II are protected against loss and may be retransmitted on command, the company said.

Another option enables existing CICS users to convert to "native mode" Task/Master operations. This feature converts CICS source programs of any language – "including CICS' Basic Mapping Support" – into Task/Master source programs, "usually with no manual intervention required," the spokesman noted.

Initial deliveries of the complete Task/Master II package are scheduled for the first quarter of 1977, although several features, including the message management facility, are available now as prerelease upgrades to existing Task/Master systems.

Task/Master II for a single CPU configuration will range in cost from $20,000 to $61,000 (or $645/mo to $1,996/mo) for DOS environments and from $42,000 to $73,000 (or $1,345/mo to $2,353/mo) for OS environments, depending on options, the company said from 111 East Ave., Norwalk, Conn. 06851.

Software Updating Enhances Sycor 350

ANN ARBOR, Mich. – System-level software for the Sycor, Inc. Model 350 intelligent terminal has been enhanced, particularly in ways that simplify distributed processing activities, according to a Sycor spokesman.

At the same time, the company has also introduced a free package allowing the Model 350 to follow Burroughs Corp. TC 500 protocol when interfacing with a Burroughs mainframe and another enhancement in support of 9,600 bit/sec data transmission (see story on Page 33).

The company's Level E library, scheduled for release next month, will have features to support real-time updating of local files, sorting of files and report generation. One of the enhancements, for example, provides dynamic reallocation of memory as user needs change, the spokesman noted.

This "user-configurable" system approach allows memory previously allocated for peripheral drivers to be freed for use by the user's data entry programs, he explained.

Magnetic tape drivers are configurable with regard to options allowing compatibility with mainframe and Sycor 340 and 350 formats.

Task Chaining

Task chaining, another of the Level E features, provides operating system control of batch stream operations – including communications, sorting, merging or printing – without operator intervention, he continued.

A command generator, meanwhile, is capable of converting user-specified key symbols and words into an executable job stream. A base program, modified by the parameter entries, is capable of performing basic functions, he said.

Improvements in the indexed access method are said to include both reading and writing support.

The Level E library will be available in a two-diskette package for $50, the company said from 100 Phoenix Drive, Ann Arbor, Mich. 48104.

'Unique' Handles Batch Input, On-Line Query, Report Output

WALTHAM, Mass. – The Unified Inquiry, Update and Edit (Unique) package from The Management Group, Inc. (TMG) is a file management system that will handle batch input, on-line inquiry and updating and report generation, TMG said.

Combining previous products and new modules, Unique consists of a data dictionary and three subsystems that use the dictionary. The software runs on IBM 360/370 and Honeywell 6000 CPUs.

Quick Change Batch (QCB), the edit and update module newly written for Unique, is a table-driven interpreter. Quick Change Real Time (QCRT), the on-line module introduced as a stand-alone product a year ago, is a Cobol generator in the Honeywell version but a table-driven interpreter in the IBM CICS version.

The report generator module in Unique is TMG's previous product, Information Quick (IQ), a Cobol generator.

With Unique, users define fields once and a single entry may include information about column headings for reports, reference to a table for validation and screen positions for on-line use, according to a TMG spokesman. Unlimited redefinition is possible, he added.

The data dictionary subsystem produces various cross-reference "where-used" reports that TMG feels can be of great use in data base control and program debugging. The spokesman also noted QCRT is a complete system for on-line environments, including screen management and generation of standard edit-update reports.

Since fields and reports are centrally defined, the user can concentrate on application logic rather than "housekeeping" chores; this reduces programming time "drastically," TMG said.

All the Unique systems have table look-up, subscripting and multiple file capabilities. Data base systems such as Cincom Systems' Total, Honeywell's Integrated Data Store (IDS) and IBM's Information Management System (IMS) can be accommodated, the spokesman claimed.

Unique is available for $30,000. The subsystems are also available separately, TMG added from 393 Totten Pond Road, Waltham, Mass. 02154.

'UFO' Avoids CICS Programming

FORT LEE, N.J. – The need for most programming in IBM Customer Information Control System (CICS) applications can be eliminated with the use of the User Files On-Line (UFO) package, according to its vendor, Oxford Software Corp.

UFO "will put any user file on-line, without programming, in a matter of minutes," an Oxford spokesman claimed. The package is said to be a dictionary-driven system that uses an on-line "fill-in-the-blanks" technique to generate CICS display, inquiry and updating applications.

UFO leads the user through the "coding" process which consists of keying responses to formatted requests for operational parameters. Once entered, the responses are stored under a user-specified name in an on-line dictionary data set from which they can be accessed for later use, the spokesman explained.

Updating the dictionary entries is nearly the same process as creating them in the first place, he noted. Multiple dictionary entries for what is essentially the same file, modified only to meet the data or processing needs of individual users, can also be maintained.

The flexibility of the dictionary data set includes an ability to have data from more than one data set simultaneously displayed and updated from a single screen, Oxford said.

Predefined display formats including literal and heading placement, field positioning and output editing eliminate many "housekeeping" chores, the spokesman added.

The basic UFO package costs $10,625 while the CICS interface module costs an extra $1,875. Lease and rental plans are also available.

Interfaces to other telecommunications monitors may be available later, Oxford added from 158 Linwood Plaza, Fort Lee, N.J. 07024.

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'Migrator' Aids Plans, Conversion to IBM 3350

ROSSLYN, Va. – Much of the decision making and work involved in moving data sets to IBM 3350 direct-access storage devices can be handled easily with the Migrator package, according to the vendor, CGA Computer Associates, Inc.

Migrator divides the problems of data set relocation into two phases: planning/identification and data set movement. To help in planning, Migrator produces a series of reports that separate data sets into categories based on common relocation requirements, CGA said.

To assist in the relocation phase, the package will actually move certain categories of files to one or more target 3350 volumes. Allocation attributes will be changed automatically and reblocking will be performed if requested, a spokesman added.

Hardware Differences

The need for a product like Migrator arose because differences in hardware characteristics between 3350s and older devices such as 3330s and 2314s meant simple volume copying would result in inefficient use of the new storage capacity, he explained.

To use the 3350 to its fullest potential, the user should consider changing block sizes and allocation attributes, the spokesman emphasized.

The user must also account for those data sets that cannot be moved simply and special consideration must be given to Isam and Vsam files and to catalogs and "unmovable" files, he said.

Time Involved

The major problem with any migration to 3350s is the time involved; in any case, the user must carefully plan the conversion ahead of time to minimize the effort and ensure files aren't lost or forgotten, the spokesman continued.

Migrator can be used under OS/MFT, MVT, SVS or MVS and no operating system modifications are required, CGA said.

The package requires a 120K region and costs $2,500.

CGA is at Suite 1015, 1901 N. Fort Myer Drive, Rosslyn, Va. 22209.

Interdata Units Linked to Univac 1100s

HOUSTON – Interdata Corp. 16- and 32-bit computers can reportedly be interfaced with Univac 1100 series mainframes, providing the small system user with access to the facilities of Univac's Exec 2 or Exec 8 environments, through the use of a software package from an independent vendor here.

Offered by Software Systems Support, Inc. (SSS), the package converts program instructions and data going to the 1100 into Univac 1004 remote job entry protocol transmissions. Responses from the mainframe are similarly reconverted to Interdata-acceptable format, an SSS spokesman explained.

The conversion to and from the 1004 protocol is "completely transparent" to the Interdata user, he added.

Since the 1004 emulator package runs in the foreground under Interdata's multitasking operating systems, a single Interdata unit may be used in place of multiple Univac 1004s. Each logical 1004 requires a separate modem, the spokesman continued.

Even with the SSS emulator in place, the Interdata machine can support background tasks including assemblies, compilations and production runs of operational programs, the software vendor said.

The 1004 emulator, available now, costs $2,500, SSS said from 14125 Norway, Houston, Texas 77047.

CMC 1800 Users Gain Sort/Merge Facility

MARINA DEL REY, Calif. – A sort/merge capability for the CMC 1800 Keyprocessing system has been recently introduced by CMC, a division of Pertec Computer Corp.

Available free to 1800 sites already equipped with CMC 1930 RPG-II, the facility can combine records from as many as seven batches or sort data into ascending or descending sequence.

CMC is at 2500 Walnut Ave., Marina del Rey, Calif. 90291.

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A case study:
How SHADOW II works at Rhode Island Hospital.
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The hospital has a 384 K 370/135. After converting to SHADOW II their TP partition size was reduced from 1140 K to 375 K. Response times were dramatically improved – approximately cut in half.
With the new system, an additional one and sometimes two batch partitions can be run concurrently with the on-line system without affecting performance significantly.

SHADOW II gives the 370/115 user a complete TP system without hiring costly new specialists or large hardware upgrades. Yet, the 370/168 user finds that the system does everything he could want.

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Recently introduced in this country by The Cullinane Corporation, SHADOW II has already proven itself here by replacing competitors (not only CICS but most independents, as well) in one installation after another.

There are a host of reasons why. But quite simply it comes down to this: SHADOW II requires less hardware than even the least sophisticated of its competitors – yet offers more flexibility, more facilities and more power than the largest and most complex of them, including its unique multi-tasking capability.

It is simpler to operate than any other system, yet it has more programming aids, more testing aids, tuning aids and utilities. Also, fewer programming restrictions.

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What's more, this new system is so easy to install we can give you an actual demonstration, in your own shop, in about an hour.

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Computer ____

Cullinane Corporation
Wellesley Office Park, 20 William St., Wellesley, Mass. 02181, (617) 237-6600

'Logout' Moves DOS Console Log Entries to Printer

LONDON – The Logout package from Software Design (UK) Ltd. was designed to permit IBM DOS and DOS/VS installations to tailor their console logs and to print all or parts of the logs on line printers at end-of-job (EOJ).

Logout accumulates console messages and responses in main memory and reproduces them for each partition on the printer at EOJ, according to the vendor. The user may specify selective printing of the messages or define the tasks from which messages are to be stored and printed, Software Design said.

The control program for Logout can be run anytime so users may modify the parameters of the printout in accordance with developing situations; with the package in place, the user exits from IBM's logic immediately before the printing of each message on the console typewriter, a spokesman added.

Writing and testing the subroutine reached through this exit is the user's responsibility, but Software Design noted the user can amend or delete messages or print extra comments at this time. Thus the log can be tailored for the individual installation.

By moving log messages to the line printer, Logout is said to save user sites the cost of multipart console typewriter paper, improve programmer productivity and enhance service levels, especially to terminal users.

Multipart paper has traditionally been required so messages of value to personnel outside operations could be sent to them without destroying the basic log. With the EOJ printer output, this need for special log paper is sharply reduced, Software Design said.

Programmers working on IBM 370/115s or 125s have typically had to wait for hard copy to be printed from the DOC file in order to investigate testing failures, the company noted. With Logout, they get the pertinent messages on their printout as soon as a job is done, it said.

Since information on rerun and error conditions is automatically printed at the end of the user's normal output, phone calls and personal visits to the data center to find out what happened to a job can be reduced, a benefit for remote job entry users, the spokesman said.

Logout may be particularly significant to 370/115 and 125 users who have a 5213 console printer, Software Design added, since "in many cases" Logout can make the 5213 redundant, cutting the user's machine rental costs.

Logout is available for about $55/mo, Software Design said from 151 Stafford Road, Wallington, Surrey, England SM6 9BN.

Package Combines Compression, Security of User Information

WILBRAHAM, Mass. – IBM 360/370 users can have data files encoded as protection against unauthorized use without having to recall a specific "scrambling" key with the Advanced Data Code (ADC) package from Hansco Data Processing, Inc., according to the vendor.

Providing data compression as well as security, the package is said to be capable of reducing the number of bytes required for data record storage by 90%. Representative savings on most files average between 55% and 70%, Hansco claimed.

Installed within a user's application program, the relocatable encode and decode modules that make up ADC reportedly handle the transformation of the original data and its restoration without additional coding on the part of the user.

Although useful in a local batch environment under either DOS or OS standard linkage conventions, ADC also provides the user with two advantages over sending "clear" data down the line; the data is unrecognizable and, being compressed, requires less transmission time, a spokesman claimed.

While Hansco's standard ADC provides the same encode-decode algorithm for all users, the company can provide an individualized version so encrypted data can only be regenerated by that user's own version of the decode module.

Written in RPG and requiring 1,500 bytes of storage, the standard ADC costs $2,000. The individualized version would probably be somewhat higher, Hansco said.

The firm can be reached through P.O. Box 236, Wilbraham, Mass. 01095.

CRT Displays System With Help of 'DSE'

NEW YORK – The Data Set Editor (DSE) package from Commercial Software, Inc. allows systems programmers working in IBM OS or VS environments to access system data sets through an IBM 3277 CRT terminal, according to the vendor.

This direct access to the systems packs overcomes the roadblocks to productivity inherent in normal OS and VS operations where constant access to a variety of data sets is required, a Commercial spokesman claimed.

With DSE, the programmer can display source files, partitioned data set (PDS) directories and volume tables of contents; he can modify or renumber existing sequential data sets or PDS or copy them to new data sets, according to the spokesman.

The package also allows the programmer to create new data sets, submit jobs and print or punch data sets, he noted.

DSE's editing portion further simplifies the systems programmer's job through its support of time-sharing style commands, Commercial said.

The system is said to be easy to use, requiring few key strokes and providing prompts to the programmer when necessary. By contrast, IBM's IEB-type utilities, normally used to work with data sets, run in batch mode, causing time delays between "shots," the spokesman said.

DSE rents for $150/mo from Commercial at 420 Lexington Ave., New York, N.Y. 10017.

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The Human Connection

Job Descriptions Faulty

Analyst With Base Skills Can Handle Related Tasks

By Richard G. Rincoe

– Special to Computerworld

General classification, education, job description and testing of a systems analyst has not been successfully accomplished because the wrong criteria have been used.

Instead of describing the analyst by the tasks he performs, we should be describing, educating and selecting our analysts by their skills.

We must stop interviewing people for experience on specific tasks; we must interview people by probing to reveal their skills. Skills are the ability to perform tasks.

The skills needed by the computer systems analyst can be broken into seven categories: problem definition, objectives definition, planning, evaluation, application of a technical background, communications and administration of a DP system.

All stages of the systems approach, however it may be defined, are performed properly when these basic skills are used. Each step in the systems approach uses all of the skills to one extent or another and all tasks are possible when all skills are available.

New Breed

The "complete systems analyst" is the new breed – versatile, open-minded and happy. Our intelligent, aggressive human can perform all of the classical tasks that pertain to different parts of the systems approach.

Problem definition is a broad term describing a skill having many facets and values. Throughout the systems approach, problems are encountered that require this skill. All too often a system is thought of as the solution of one or of a few large problems.

In reality, countless minor problems are the subject for attack, and the prominent difficulties turn out to be merely symptoms.

Defining objectives of a specific goal in detail must be the skill of every analyst. A clear target thoroughly defined is only part of defining objectives.

All aspects of how the object solution will be implemented and accepted must be considered. This hard look at a proposed solution requires an objective individual who will accept and evaluate criticism.

Planning is a skill envied as much by the general public as by the systems analyst. The development and smooth running of every involved system requires the skill of an organized person who has an orderly, logical mind.

Defining a problem and setting an objective are useless without a plan for making one solution out of the two states. Logic and relational thinking are the foundation for the planning skill.

Applying a technical background is a skill that is developed as our analyst climbs the ladder of DP experience. This skill is found most often in those who have worked their way up from the bottom but were not afraid to learn from those who worked their way down from the top.

Practical, hands-on experience cannot be replaced. All systems analysts need operational, programming and sheer business experience.

The ability to evaluate objects and circumstances pops up in the problem definition stage all the way through to the implementation stage. How can one see whether the plan is being followed if one cannot evaluate its progress, procedures and data?

This skill requires, to some extent, an egoless person who will do what is best and not what looks best. A firm math background assists in this analytical skill, particularly in the area of statistics.

Communications capability can mean the difference between having cooperation among departments and individuals and having stumbling blocks. Fear of computers and new systems can be overcome only by an honest, smooth, soothing presentation of both the good and the bad sides.

Administration of DP systems is the cohesive factor in carrying out DP systems development. This skill requires the leadership of a person who has self-control and courage.

It is not necessary to create a job description of 200 or more miscellaneous tasks to fill your needs. Demand appraisal of computer systems analysts' seven basic skills. If even one of these skills is lacking, the people are not analysts.

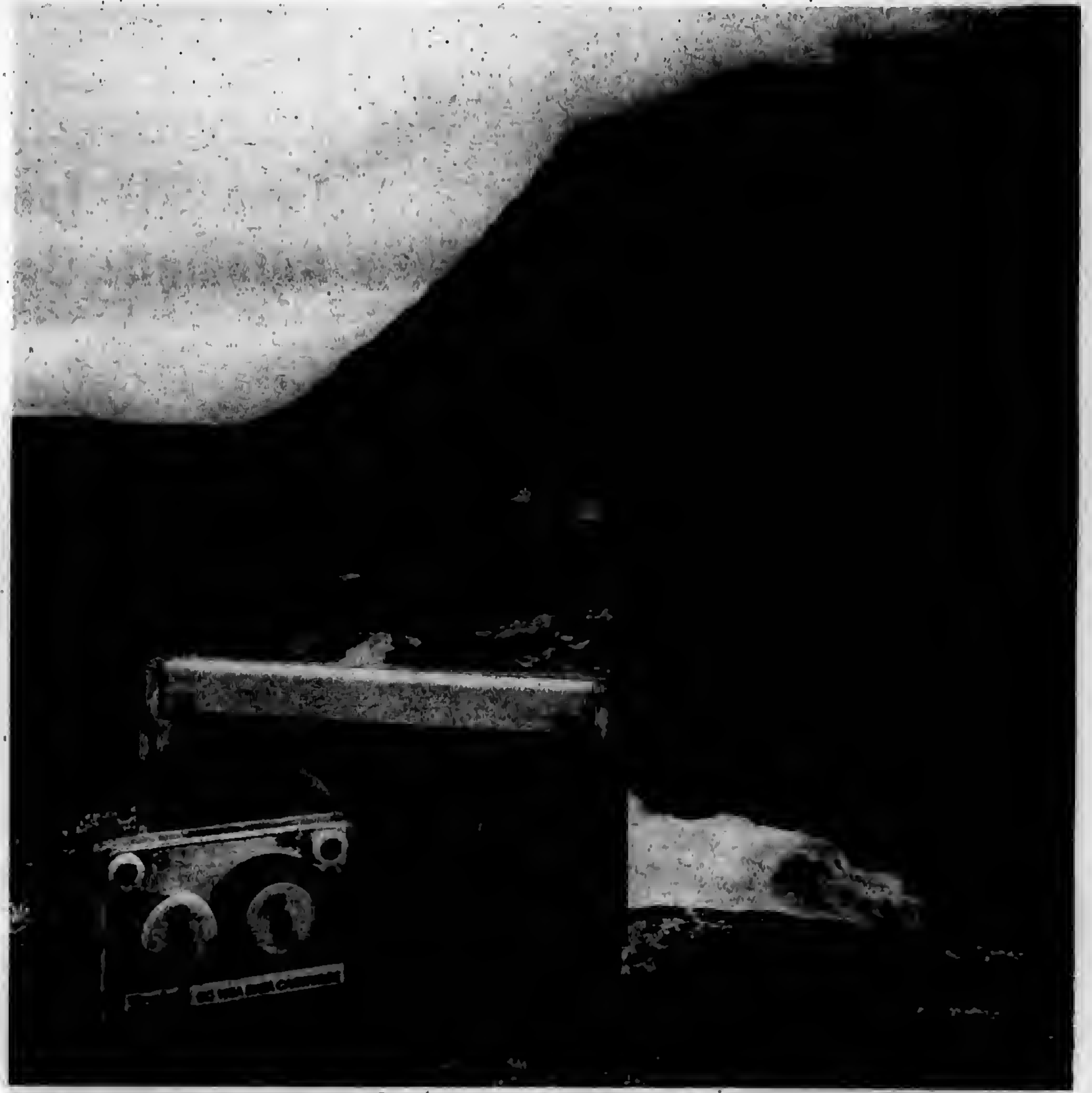
Rincoe is a systems analyst with the central office of the Veterans Administration whose duties involve developing training programs for other analysts.

Tailoring Seen Key To MVS/JES Course

AVON, Conn. – A Multiple Virtual Storage/Job Entry System (MVS/JES) training course from Computer Systems Research, Inc. (CSR) consists of a 1,300-page, seven-volume set of books organized into 46 independent segments to permit customized study, the vendor said.

Depending on the student's prior experience, the time needed to work with all 46 segments may vary from 40 to 120 hours, CSR estimated. Eleven "typical" JES3 job functions are defined and study time for each of these will range from 25 to 35 hours, a spokesman added.

A one-time license fee of $3,600 includes all basic training material and instructions on how to tailor the course to individual needs, the company said from Suite 11, W. Main St., Avon, Conn. 06001.



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As Technology and Competition Grow

Users Told to Expect New Services and Lower Rates

By Molly Upton
Of the CW Staff

TORONTO — Telecommunications users can expect new services as well as lower rates as competition and technological developments continue to increase, panelists at the Association of Data Processing Service Organizations (Adapso) conference said here last week.

Among the services mentioned during Adapso's 45th annual management meeting were two data base-oriented services from international record carriers and a satellite delay compensation unit, designed to improve satellite communications throughput, from American Satellite Corp. (Amsat).

Bell's Transaction Network installed in Seattle is an indication the firm intends to offer more network services including more systems approaches, according to Wayne A. Rohins, of AT&T's data systems division's marketing department.

It also plans to offer switched Dataphone Digital Service (DDS) and international Dataphone, he said.

Robins admitted Bell is foremost among the carriers that have not satisfied a number of remote user problems. Users haven't really heen offered systems solutions distinct from transmission services, he observed.

As a result, users have not had the opportunity to implement control over these services nor have they had good systems flexihility, cost effectiveness or standard price and availability, he said.

Others, such as Telenet and Tymnet, have done hetter in these areas, he confessed.

"Bell is beginning to recognize sophisticated users have an increasing need for specified solutions," Rohins said.

The transaction network in Seattle is designed for applications requiring a short connect time. Bell expects to have the network up in Minneapolis during the first quarter of 1977 and in other places pending tariff approval, he stated.

John A. Keyes, vice-president of marketing for Amsat, said the firm is about to introduce a Satellite Delay Compensation Unit (SDCU) designed to improve satellite communications throughput.

The unit, which is between the host CPU and the modem, uses a protocol that is "completely transparent" and handles bisynchronous and IBM Hasp interleaving formats up to 9,600 bit/sec, he said.

In some cases throughput has been increased from 55% to 90%, he noted.

There are prohlems in throughput via satellite ahove 2,400 bit/sec with short messages, he said. Since there is an inherent time delay of 534 msec, Amsat's SDCU uses a protocol which helps to alleviate the effects of the time delay, he added.

Tariff Filed for DBS

Serge Wernikoff, vice-president of planning for Western Union International, said the firm recently filed a tariff for a data base service (DBS) with the Federal Communications Commission (FCC).

Initially, the service will he offered hetween the UK and the U.S. and pricing will he ahout $10/hr and $.50 per 1,000 characters, he said.

Tymnet has subscribed to connect with the DBS, he added.

International record carriers are regulated hoth hy the FCC and also by an overseas agency, he said. Their geographic coverage is limited by the FCC to five U.S. cities: New York; Washington, D.C.; San Francisco; New Orleans; and Miami, he added.

In addition to dealing with overseas regulatory authorities, these carriers are not permitted to provide the equipment at the overseas points.

Illustrating that competition among data carriers is not limited to those operating solely in the U.S., Harry Schwedock, Communications' vice-president of marketing for ITT World Communications, told the group ITT is planning a universal data transfer service (UDTS) and a data pipe service.

The UDTS will be for the small- and medium-size user with "quasi packet switching," designed for applications such as time-sharing and remote data base services, he said. It will be a high-value-added service, he added.

The firm hopes to be in three locations by the end of the year. Among the possible locations are France, Switzerland, Italy, Japan and Brazil, he said.

ITT's data pipe will be volume sensitive, dial or dedicated channel, with low value added, Schwedock said.

Things move relatively slowly in the international area, he said, explaining in the U.S., one must gain government approval while abroad there is relatively no competition and therefore no impetus for rapid changes.

Multiple-Connect Feature

Stuart Mathison, vice-president of Telenet, said users will be hearing more about X25 since it was approved recently by the Consultative Committee International Telephone and Telegraph (CCITT).

Telenet plans to implement the standard by January in its multiple-connect feature which enables a host computer to talk to many terminals at the same time, he said.

Under the multiple-connect feature, Telenet provides a modified emulation program for a front end so it resembles an IBM 270X, Mathison stated.

There are no host software changes necessary and the user can specify parameters of operation, he added.

Telenet also handles Digital Equipment Corp. Decsystem 10s and Honeywell gear, Mathison noted.

The other method of connecting to Telenet is via emulation, wherein the firm installs a multiplexer. Seventy out of the 90 computers using Telenet use this type of connection, he added.

Telenet plans to supplant its minis with multiprocessor microprocessor-based hardware, he said. New services will be easy to introduce since the software can be upgraded quickly, Mathison noted.

Afips Conference Starts Today

WASHINGTON, D.C. — The American Federation of Information Processing Societies (Afips) is providing a two-day Planning Conference here for the Federal Communications Commission (FCC) heginning today.

The conference is a separate hut related reaction to the FCC's July 30 announcement of the initiation of a second "Computer Inquiry."

It is directed toward providing technological hackground relevant to the inquiry and considering regulatory policy related to computer communications and the use of computers in communications, according to Afips.

The conference is heing held at the offices of the FCC, 1919 M St., N.W. and it is open to the puhlic.

Afips is located at 210 Summit Ave., Montvale, N.J. 07645.

Tano CRT Terminal Features Automatic Operations Switch

METAIRIE, La. — Tano Corp. has brought out an intelligent CRT communications terminal designed for distributed processing and source data entry applications which it said can automatically switch from off-line to on-line operation.

Outpost 7 includes a Motorola Corp. MC6800 microprocessor with 8K bytes of memory expandahle in 4K-byte increments to 64K, the company said. The microprocessor reportedly allows programmable data and error checking.

In addition, the terminal comes with one cartridge tape drive which uses 3M Co. data cartridges capable of storing over 250K characters of information, a spokesman noted, adding a second cartridge is offered as an optional accessory.

An RS-232C serial interface allows the Outpost 7 to communicate asynchronously with other terminals or modems. The terminal features programmable block size and automatic parity generation and checking, he said.

The terminal has switch-selectable transmission rates from 110- to 9,600 bit/sec in serial Ascii; Ebcdic code is offered optionally, the spokesman added.

The on/off-line capability reportedly allows an Outpost 7 to communicate with a host computer in batch or real-time modes.

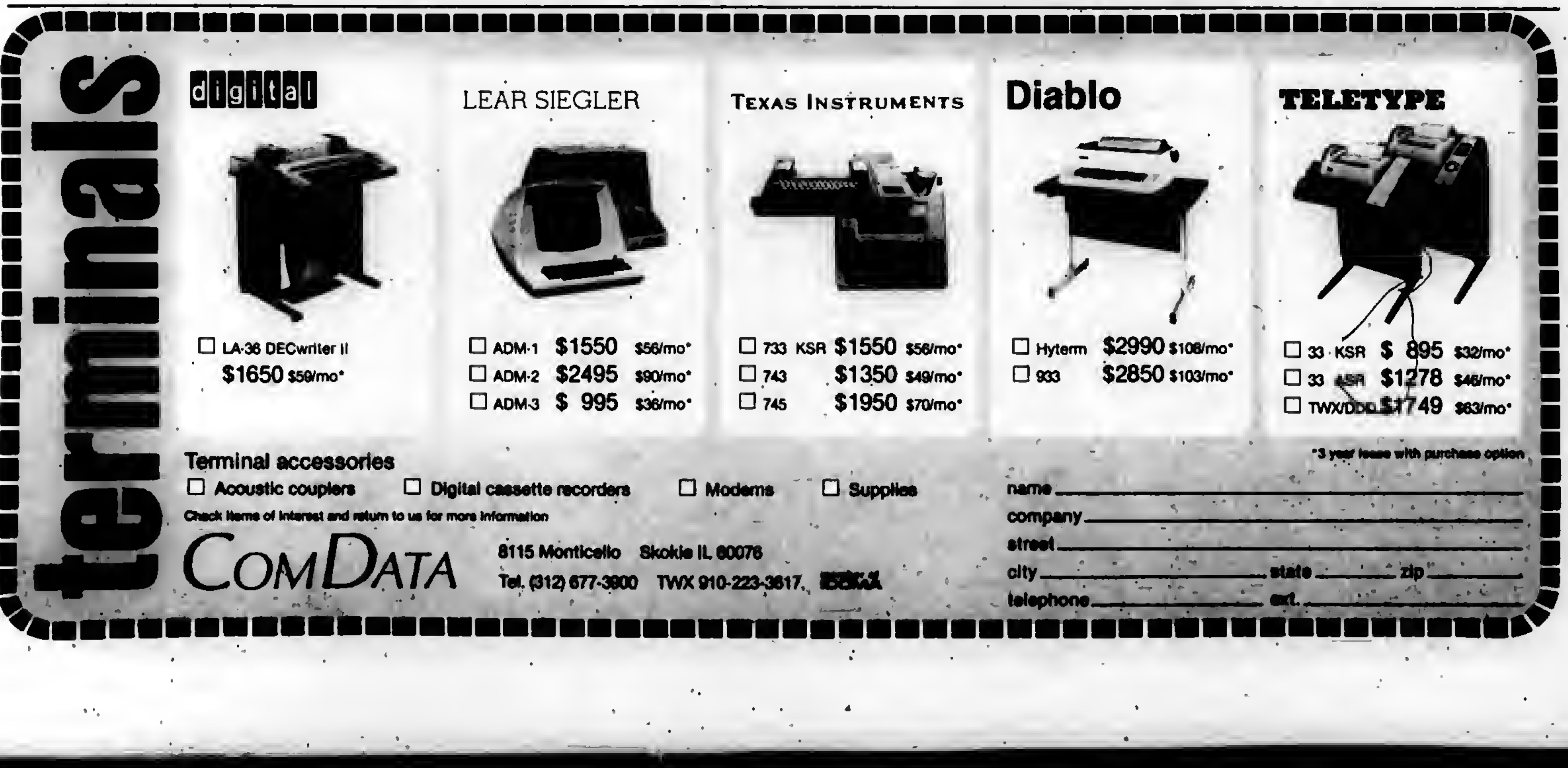
A 96-character Ascii keyboard with 10-key numeric pad is said to be teletypewriter-compatible; 5 by 7 dot matrix characters are displayed in a 24 by 80 character format, according to the spokesman.

Transmission from the unit is accomplished in conversational, message, page or multipage modes, he added.

Outpost 7 functions include editing, a special formatting mode for custom CRT formats and a search function for automatic location and retrieval of tape records by character string identifiers, Tano said.

An optional printer interface allows communications with any serial-type printer or 40-column printer, the company added.

The Outpost 7 with 8K of memory is priced at $3,500 from Tano at 4521 Napoleon Ave., Metairie, La. 70001.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LSI Device Works at 9,600 Bit/Sec

Codex Modem Designed to Meet CCITT V.29 Standard

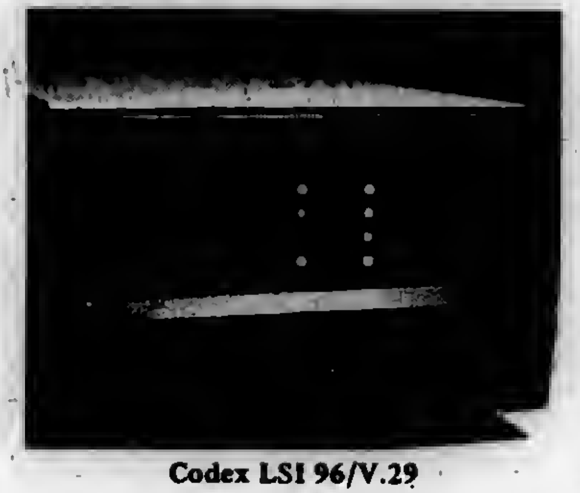
NEWTON, Mass. – Codex Corp. has an LSI, 9,600 bit/sec modem designed to meet international communication specifications.

The company's LSI 96/V.29 modem is said to be compatible with the Consultative Committee on International Telegraph and Telephone (CCITT) Recommendation V.29.

According to Codex, the international recommendation specifies a modem with maximum operating speed of 9,600 bit/sec utilizing an automatic and adaptive equalizer and combining amplitude and phase modulation.

The LSI 96/V.29 includes a four-channel multiplexer; a four-channel buffered multiplexer which allows passage of control signals and individual channel loopback; and an eye pattern generator, Codex said.

It also has remote loopback capabilities, a 75 bit/sec secondary channel, elastic store buffer for master-clocked systems and a built-in modem sharing unit, the company added.



Codex LSI 96/V.29

The modem can operate with the Codex Circuit Quality Monitoring System (CQMS) to provide a visual display of line disruptions as well as a qualitative indication of line amplitude and delay distortion, according to the firm.

It can operate over M58 or M102 lines and has four operating modes; a front-panel, five-digit display reportedly identifies the main channel data rate and mode and gives a readout of any selected channel in the multiplexer.

The modem has four fallback speeds of 7,200-, 4,800-, 4,800-narrowband, and 2,400 bit/sec to keep the system operational over severely degraded facilities, the company added.

The LSI 96/V.29 is priced at $9,350. Codex is at 15 Riverdale Ave., Newton, Mass. 02195.

MPL Tariff Data Offered on Net

ANN ARBOR, Mich. – DMW Telecommunications Corp. is offering pricing information on AT&T's recently effected Multischedule Private Line (MPL) tariff on the Automatic Data Processing/Cyphemetics national network.

DMW's on-line "Communications Tariff Guide" for pricing communication network alternatives provides definitive answers on tariff changes and network options, according to a DMW spokesman.

The guide reportedly enables users to reconcile new charges resulting from the MPL tariff and to redesign networks to compensate for the tariff, which went into effect Aug. 19.

Computes Net Prices

The on-line program computes prices for leased line telecommunications networks; it will automatically price individual point-to-point and individual multipoint lines for a variety of tariffs, including all Bell System interstate leased offerings, the spokesman added.

The service is available on a quarterly subscription basis for $240, which includes updates to the guide and user documentation provision, plus the usage charges on the network, he said.

Updates are expected to be made to the guide on a regular basis, the spokesman noted from DMW at 2975 Hickory Lane, Ann Arbor, Mich. 48104.

GDC Unit Interfaces Terminals, Modem

WILTON, Conn. – The MAU-1 multiple access unit from General Datacomm Industries, Inc. (GDC) is said to provide the RS-232 or CCITT V.24 interface between multiple terminals at the same location and a single modem or Bell Data Service unit.

The MAU-1 features four terminal ports, operation with synchronous and asynchronous terminals up to 19.2 kbit/sec speeds, cascade operation and nine LED indicators of operation status, according to a GDC spokesman.

The MAU-1 can be used to split out a time-division multiplexer channel to several terminals or to cascade the device to seven or more terminals, he said.

Multiple Terminals

In a polled network, the spokesman added, one modem can be used to service multiple terminals; each MAU-1 terminal port can be extended geographically by interfacing it to a modem, he said.

Where communications service includes a Bell Dataphone Digital Service (DDS) unit, a GDC analog extension unit is required between the access unit and the modem, he noted.

Each MAU-1 device costs $575. GDC is at 131 Danbury Road, Wilton, Conn. 06897.

Guide on Maintenance Free

SADDLE BROOK, N.J. – A free brochure which rates DP vendors' maintenance performance on communications networks and/or distributed processing and multivendor terminals is available from Sirvess, Inc.

The booklet also helps establish criteria for third-party maintenance. Sirvess is at 50 Market St., Saddle Brook, N.J. 07662.

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Food Supplier Saves Time, Money With Small Terminals

CHICAGO – Utilization of portable data entry terminals has reportedly reduced errors, delays and DP expenses for Swift Food Service Company (SFSC), a division of Swift & Company here.

Swift's 65 sales units in the field are using MSI Data Corp.'s Source 2100 key-entry portable data terminals to record and transmit daily sales and invoicing data.

According to Thomas V. Cecil, SFSC president, the terminal system replaces a method which depended on mailing handwritten mark-sensitive forms to the DP center here.

Robert Anderson, assistant controller of the Swift division, reported the company has been able to justify annual expenditure for MSI equipment and the Wats telephone network as a trade-off against the savings in printing the order forms to stringent optical character recognition (OCR) requirements and the savings in mailing those forms to Chicago each day.

Additionally, since several of the preprocessing steps such as OCR scanning and keypunching have been eliminated, Swift has also eliminated more than $100,000 in DP expenses, Anderson said.

Sales data for each branch office is now being recorded on the portable data entry terminals by keying in numeric product codes, quantity, weight and prices on the terminal's keyboard touchpad.

The data is recorded on the terminal's magnetic tape cassette in a computer-compatible format. Once recorded, the information is transmitted over dial-up phone lines via the Wats communication network at the rate of 1,200 bit/sec, Anderson said.

An IBM System 7 communications processor automatically polls each branch office every evening and receives the data in a format that allows for direct input into the DP center's IBM 370/158 mainframe without further preparation or data handling, he stated.

Reading Problem

Prior to employing terminals for data entry, Swift branch personnel handprinted the information on expensive mark-sensitive forms and mailed them to Chicago for processing, he explained.

An ongoing problem was that the OCR scanner was never capable of reading more than 55% of the handwritten data. The remaining "unreadable" forms had to be sent to an outside service for keypunching.

The repeated handling of the forms by clerks and keypunching operators resulted in numerous errors because individuals so far removed from the original source of the data were not familiar with Swift's coding system, he added.

Because of the high error rate, printouts from the keypunched data often had to be sent back to the branch level for editing and correction before the data could be processed and the appropriate forms printed by the computer, according to Anderson. The result was an extremely lopsided work schedule in which massive processing times occurred on Fridays, Saturdays and Sundays, he said.

Personnel Easily Trained

The Swift data entry system was developed around the portable terminal because of the ease with which existing branch personnel could be trained to operate the equipment, Anderson said; adding once the data entry system was conceived and the programs were written, only one day of training was required to teach branch personnel how to operate the equipment competently.

The system enables each branch to maintain much closer contact with its own data; the responsibility for data accuracy now falls directly upon the individual keying the information into the MSI terminal, a person who is close to and familiar with that particular input data, he said.

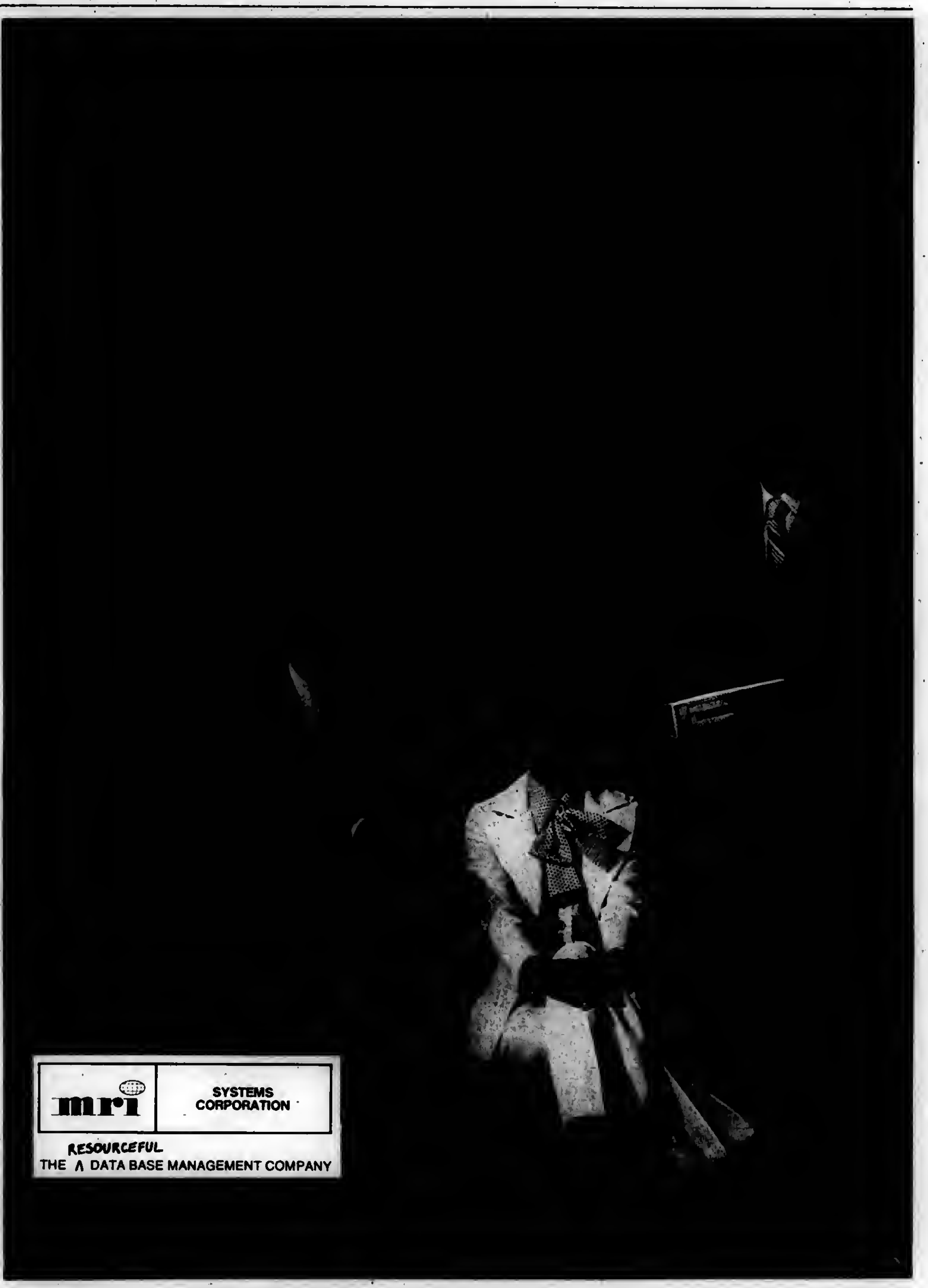
The terminal has a built-in check digit feature which sounds an audible alarm when a customer code number is entered incorrectly, thereby facilitating catching and correcting errors as they occur, Anderson explained.

Turnaround Time Cut

Operational since last February, the data entry system has cut days from the turnaround times required to update branch files and deliver invoice statements to Swift Food Service customers nationally.

This reduction in time has reduced the amount of receivables capital previously "floating" between order delivery and payment and has resulted in better customer service and more timely accountability, he noted, adding 14,000 statements are processed, printed and delivered each week.

Terminal Transactions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SYSTEMS CORPORATION
THE RESOURCEFUL DATA BASE MANAGEMENT COMPANY

Terminal Transactions

Including Emulation Protocols

Delta Adds Four Enhancements to Its Series 4000

CORNWELLS HEIGHTS, Pa. – Delta Data Systems Corp. has added four enhancements to its Series 4000 factory- and user-programmable video display terminals.

The additions include a programmable character generator, communications protocols to emulate Burroughs, Honeywell and Univac systems, a programmable keyboard addition and a light pen option.

The programmable character generator is offered as an option on all Delta 4000 Series display terminals and is used to provide custom character sets in low-volume applications, according to a spokesman.

The generator is said to incorporate a programmable read-only memory (Prom) and is available with up to 128 different characters. It costs $60 plus a one-time engineering charge, which depends on the user's application, he said.

Emulation Protocols

Protocols to emulate Burroughs TD-820 terminals are presently available on the Series 4000 CRT terminals, he said. The protocols for Honeywell VIP 770 terminals and for Univac Uniscope 100 and 200 terminal models will be available on Nov. 15 and Dec. 30 respectively, he added.

Series 4000 terminals with added protocols will cost $3,025, he said.

The company will integrate, as of Dec. 1, the Prom keyboard into all of the company's 4000, 4500 video display terminals and 4700 display terminal and storage systems, according to the spokesman.

The keyboard is said to enable customizing keyboards for unusual applications. Features include a programmable four-mode code level, lighted and colored function keys, "N" key rollover, repeat functions and the availability of 107 different keys, he said, adding there is no additional charge for the option.

Delta's light pen option is said to allow the terminal operator to position the cursor within the display area.

Computer control of the terminal can be maintained while the light pen is in use, he noted. The host CPU can assume control for the purpose of reentering data and integrating the memory and can perform other functions under the direction of the host software upon receipt of the cursor address codes from the terminal, he explained.

The light pen option costs $1,000, the spokesman said from Woodhaven Industrial Park, Cornwells Heights, Pa. 19020.

Video Terminal Communicates Via Television

SANTA CLARA, Calif. – Microcomputer Associates, Inc. unveiled a video display terminal that reportedly allows communications from a microcomputer to a CPU when connected to an ordinary television set.

The VT 100 terminal is said to be a replacement for teletypewriter terminals and conventional CRT terminals.

Standard interfaces include an RS-232 connection as well as a 20mA current loop; and a full Ascii keyboard includes upper- and lower-case alphabetic characters, according to a spokesman.

Function Switches

Function switches on the device include local/line, line truncation, transmit control character and store receiving control character, he said.

A rotary switch is said to allow selection of full-duplex transmission of data at speeds up to 9,600 bit/sec.

In addition, a readback function switch allows reading and transmitting all or part of a 1K-character screen memory to the CPU and allows the VT 100 to perform local editing, according to the spokesman. The buffer can be expanded to 8K characters, he noted.

The VT 100 displays 5 by 7 dot matrix characters on the CRT screen in a 32-character by 16-line format, he said.

Microcomputer Associates is offering the VT 100 at a special introductory price of $495; the normal price of the system is $595, he noted from 2589 Scott Blvd., Santa Clara, Calif. 95050.

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Sycor Upgrades 350

ANN ARBOR, Mich. – Sycor, Inc. has upgraded the communications capability on its Model 350 intelligent, dual floppy disk terminal to 9,600 bit/sec.

The increased binary synchronous communications rate upgrade from 1,200 bit/sec is available in conjunction with Sycor's IBM 2770 and 3780 remote job entry (RJE) terminal emulation package, the company said.

Sycor's RJE package is said to feature IBM space compression and record blocking.

The communications option is aimed at high-volume locations where print applications are a paramount consideration.

The capability can be added onto existing Model 350 terminals in the field although a communications adapter is needed, which costs $20, he said.

Sycor is located at 100 Phoenix Drive, Ann Arbor, Mich. 48104.

Terminal Transactions

Perkin-Elmer Introduces Printers Featuring Paper-Handling Capabilities

RANDOLPH, N.J. – The Terminals Division of Perkin-Elmer Data Systems has brought out three communications-oriented terminals with advanced paper- and forms-handling capabilities, according to a spokesman.

The Carousel Models 310 and 320 have plotting capabilities of 60 char./sec and 120 char./sec, respectively, while the Carousel 350 has no plotting capability and is intended primarily for financial-oriented applications, the spokesman indicated.

Each of the terminals operates on a standard asynchronous protocol for 300 bit/sec communications and 30 char./sec print speeds along with a 128-character first-in, first-out (Fifo) buffer and RS-232 or CCITT V.24 interface as standard equipment, he said.

An optional 20 mA current loop interface is available for $75, he added.

The terminal line has a power front-forms insertion device which automatically feeds ledger cards, single sheets and bottom-glued multipart forms into the platen, he said.

An additional accessory enables the insertion device to handle multipart forms which are not bottom-glued, even when the sheets comprising the form are of varying lengths, he claimed.

Also offered are pin-feed tractors, a journal roll holder and an automatic feeder/stacker for feeding, positioning, imprinting and stacking forms under computer control, according to the spokesman.

The Carousel 350 includes a split platen which has the ability to accommodate two paper-handling devices simultaneously; the split platen reportedly can be easily removed and replaced with either a solid platen or another configuration of split platen.

Each of the four-platen configurations has an independent format control that permits left margins as well as horizontal tabs to be set independently, he said.

The Model 310 has a single platen, reportedly enables 4,800 point/sq in. plotting and can accept any forms-handling device in the new terminal line, according to the spokesman.

The 320 model is an I/O printing terminal including a 120 char./sec paper-tape reader and 60 char./sec plotting capability, he said.

It can be used as a replacement for an automatic send/receive teletypewriter, a printer and a plotter, he added.

Additional features common to all three models include interchangeable fonts, rear-feed paper path and a 128-character keyboard consisting of upper- and lower-case letters, numerals and special symbols.

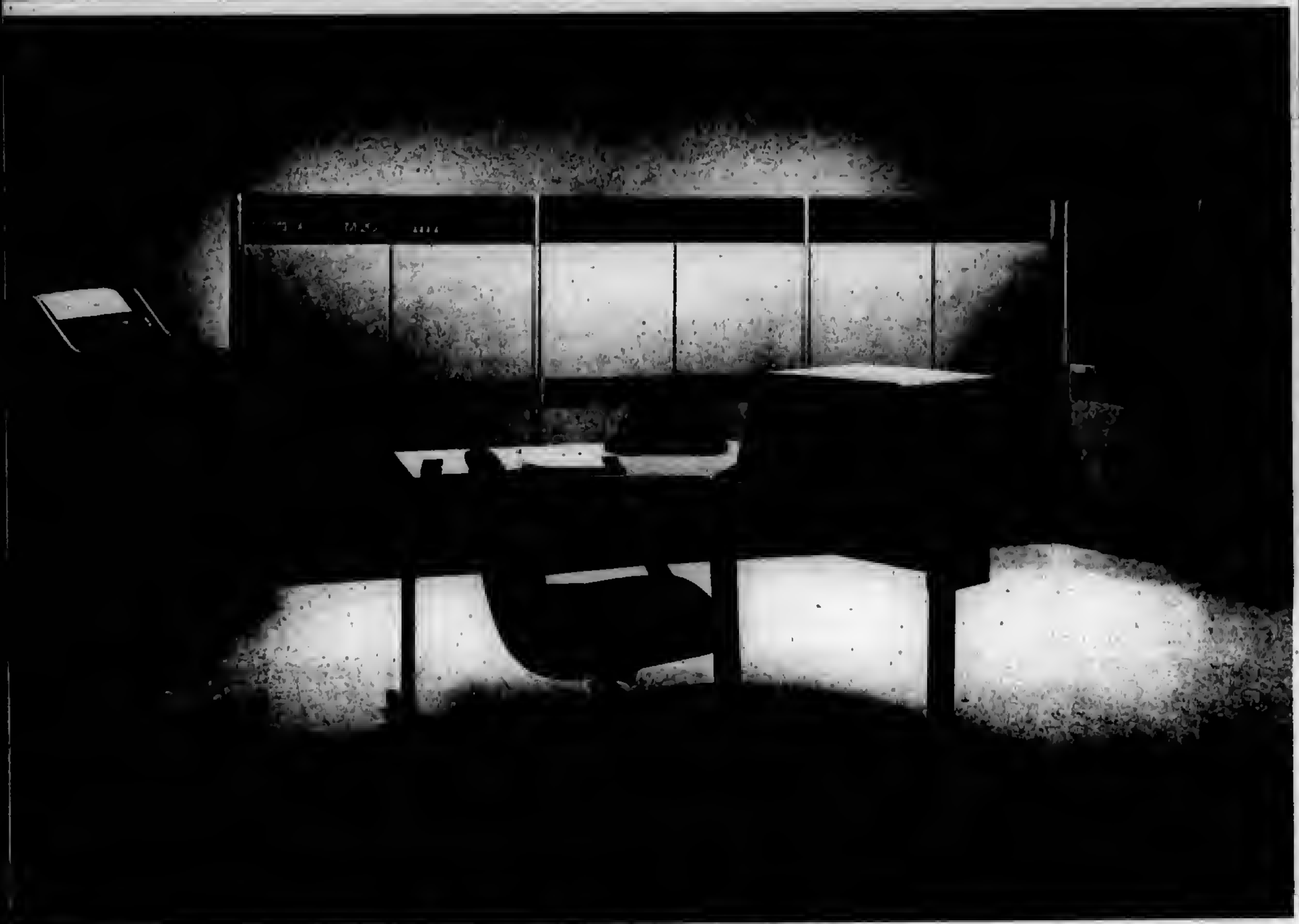
A space compression feature is said to automatically convert multiple spacing codes into faster tab operations for printing throughputs in excess of 45 char./sec.

There is also a control option for the Fifo buffer allowing bidirectional communications with a host CPU at 1,200 bit/sec transmission speeds, the spokesman noted.

When the 128-character buffer reaches a storage capacity of 96 characters, a "stop sending" code is sent to the host CPU software, he explained, adding the CPU will again transmit data when the buffered storage amount drops to 50 characters.

The buffer control option costs $50. The Model 310 costs $2,995; the Model 320, $3,945; and the Carousel 350, $3,995, he said.

Perkin-Elmer is located at Randolf Park West, Route 10 and Emery Ave., Randolph, N.J. 07801.



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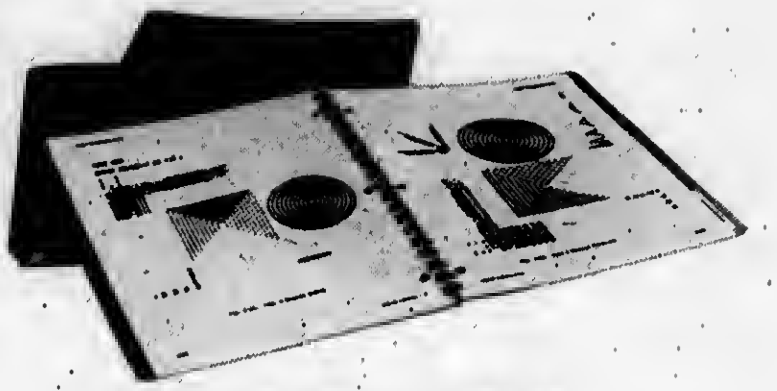

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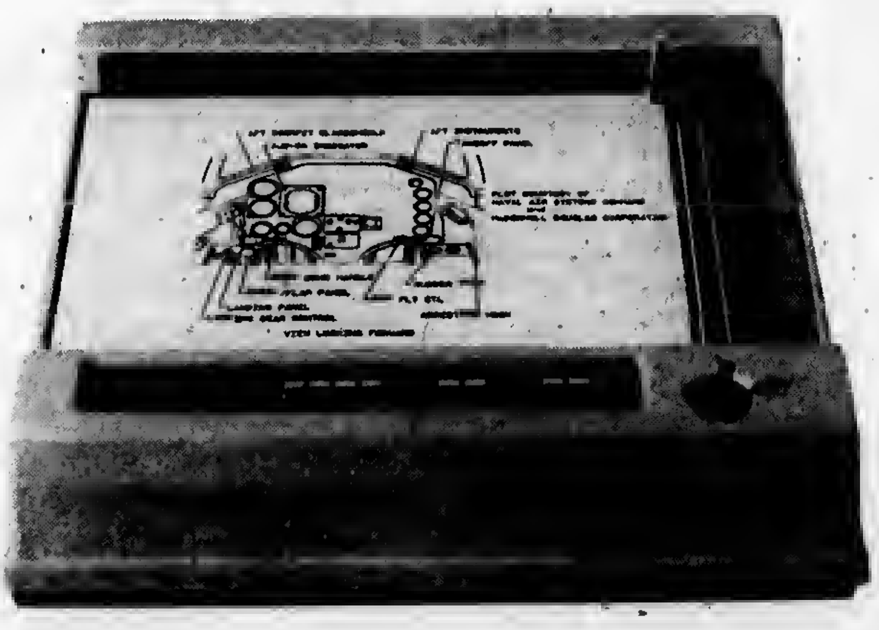


Bits & Pieces

Tab Buffered Card Unit Can Be Used Remotely

PALO ALTO, Calif. – The Model 560 series output card punches from Tab Products Co. are fully buffered units that can operate on-line in the proximity of the host system or remotely, the firm said.

The 560 series can handle 80-column card output from a wide variety of host devices, the company said.

Model 560 is an 80-column punch with a 54- to 92 card/min speed and includes a parallel interface; translate feature of Ascii or Ebcdic to Hollerith; 80-column buffer; 700-card hopper and stacker; and parity. It costs $4,270 in OEM quantities, the company added.

The Model 561 has a print feature and costs $4,935 in OEM quantities; Model 562 also has a print feature and punches 54 to 94 card/min, the company said.

Options include an RS-232C serial interface and current loop interface, the company added from 2690 Hanover St., Palo Alto, Calif. 94304.

Conference Set for New Users

COSTA MESA, Calif. – Computer Micrographics Technology (Comtec), an association for users of computer output microfilm (COM), will hold a conference Feb. 21-25 in Houston for new and potential users of computer micrographics.

Featuring a seminar on "The Fundamentals of COM," the conference will also include specialist seminars on business COM, COM-related photocomposition and COM graphics for business and scientific applications, a spokesman said.

The "Fundamentals of COM" seminar costs $95; the four-day conference costs $100, which includes a year's membership in Comtec and a reserved seat at the keynote luncheon.

Comtec is at 290 Fischer Ave., Costa Mesa, Calif. 92626.

Drafting System Introduced

SAN ANTONIO, Texas – The EDP 11/75 Drumbeater flatbed drafting system from H. Dell Foster Co. is a modular stand-alone unit offering a resolution of .001 in., repeatability of ± .002 in. and a plotting speed of 35 in./sec, according to the vendor.

The 42-in. by 42-in. unit is tiltable to 55° to help save space, the firm said, and features a three-position universal drafting head for ballpens or wet pens.

The base price for the EDP 11/75 Drumbeater is $18,700. The company can be reached through P.O. Box 32581, San Antonio, Texas 78215.

Amdahl: A Measure of Protection

IBM-Amdahl Pact Has User Implications

By Ronald A. Frank
Of the CW Staff

LAS VEGAS – The recent licensing agreement signed between Amdahl Corp. and IBM allows each company to utilize the other's hardware and software patents without any fear of legal penalties and has implications for both IBM and Amdahl users.

The rights covered by the agreement apply to new patents for a period of five years and provide continuing rights for earlier patents, Dr. Gene Amdahl said in a news conference here recently.

As a condition of the agreement, IBM wanted the right to utilize patents covering Amdahl equipment and it may well make use of some concepts used in the Amdahl 470V/6, Amdahl said.

Measure of Protection

The agreement provides a measure of protection for Amdahl users in that it will be very difficult for IBM to introduce concepts that are not compatible with the Amdahl equipment.

In order to introduce such a noncompatible offering, IBM would first have to discover a way to "stymie court action," Amdahl said.

The patents covered by the agreement cover concepts related to the 360 architecture and CPU channels plus a few software patents.

Users of Amdahl CPUs should no longer have a fear of possible infringement actions from IBM as a result of the licensing agreement, Amdahl said.

The recent introduction by Itel Corp. of a Model 158 level processor is a cause for some concern because there is doubt about the level of support that will be provided, Amdahl said.

He called the Itel systems a modular approach and said whenever a system has so many 'pluggable connections," there are many things that can go wrong.

Users' hesitancies about the Itel equipment could affect users' opinions about the Amdahl 470 which is a Model 168-level CPU, he said.

Despite this, the Itel systems should not be considered competition of the 470, he said.

Amdahl has installed about 23 mainframes, and relationships with customers

(Continued on Page 39)

Newspapers Share Twin Systems For Business and Production

By Esther Surden
Of the CW Staff

PORTLAND, Ore. – Twin mainframes, dedicated to business and production applications, have given the Oregon Publishing Co. here single vendor control and complete system backup, according to Carol Lewis, systems engineer.

The company, which publishes *The Oregonian* morning daily, *The Oregonian Journal* evening daily and *The Sunday Oregonian*, decided to convert from hot to cold type while automating many of the physical and business operations of the newspapers made in 1971, Jim Rogers, director of publication, recalled.

Two IBM 1130 systems were in use in the production department to produce paper tape to drive the typesetting systems and an RCA 301 was used for the business functions, Lewis said. The systems were not integrated in any way, she noted.

The firm had just started converting to an RCA Spectra system when the decision to bring both production and busi-

(Continued on Page 38)

An Oregon Publishing Co. System

IBM Array Processor Analyzes Seismic Data From the Field

WHITE PLAINS, N.Y. – The 3838 array processor from IBM is designed to operate with a 370/158 or 370/168 to analyze seismic data from field explorations.

The array processor, primarily designed for use in the oil exploration industry, contains special algorithms for the reduction of seismic data, IBM said.

The 3838 can accommodate 256K bytes, 512K bytes or 1M bytes of bulk storage, the firm said. It operates in parallel to the 370 host, attaching to the standard block multiplexer channel and is supported by the OS/VS2 MVS operating system, it added.

A vector processing subsystem operates in the host to provide user access to 3838 algorithms via application programs written in Fortran, Assembler or PL/1 language, IBM noted.

The system, basically a single precision floating-point arithmetic processor, is made up of channel interface, bulk storage, data transfer controller, arithmetic processor and control processor.

The channel interface handles the input of data and control instructions and the output of results through the host's block multiplexer channel at rates of up to 1.5M byte/sec, the firm said.

Data rates of up to 3M byte/sec are available with the 168 and the 2880 block multiplexer channel with available options, it added.

Concurrent Job Storage

Up to seven jobs can be concurrently stored in the bulk storage, IBM said. The storage maintains initial, intermediate and final results.

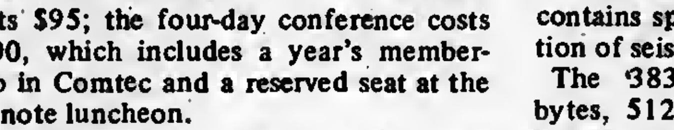
Transfer of data among the system's functional elements is handled by a controller for that purpose, IBM noted.

The arithmetic processor includes an arithmetic unit with a 100-nsec cycle time Control storage of 16,384 bytes is standard, the firm noted.

The control processor manages the functional operation of the system.

The Model 1 array processor costs $17,875/mo on a standard rental plan or $780,000 to purchase; the Model 2 costs $21,725/mo or $864,000 to purchase; the Model 3 costs $29,425/mo or $1,032,000 to purchase, according to IBM.

A term lease plan is available for the systems which will be available in the fourth quarter of 1977.



Three guesses whose serial printers topped the Datamation Brand Preference Study in '74, '75 and '76.

Centronics. Centronics. Centronics.

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Centronics Data Computer Corp., Hudson, N.H. 03051, Tel. (603) 883-0111, Twx. 710-228-6505, Tlx. 94-3404; Eastern Region: (617) 272-8545 (MA); Central Region: (513) 294-0070, Twx. 810-459-1754 (OH); Western Region: (714) 979-6650, Twx. 910-595-1925 (CA) Centronics Data Computer (Canada) Ltd., Ontario, Tel. (603) 883-0111, Twx. 710-228-6505; Centronics Data Computer (UK) Ltd., Cheam, Surrey, England, Tel. 643 0621-4, Tlx. 851 945756; Centronics Data Computer, GmbH, 6 Frankfurt/Main., West Germany, Tel. 663321/22, Tlx. 841 413224; Centronics of Puerto Rico, Dorado, Puerto Rico, Tel. (809) 796-1881. Tlx. 3859349

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There are six entry-level packaged systems in the CREATE series, ranging in price from $35,000 to $200,000. All can be easily expanded with a full range of peripherals, including disks, printers, terminals, electrostatic printer/plotter, unit record devices and data communication controllers.

It's amazing what one Prime computer can do. To find what one can do for you, call or write to: David R. Johnson, Product Manager, Prime Computer Inc., Box 2600, Framingham, MA 01701 (617) 879-2960.

PRIME

Oregon Newspapers' Twin Systems Provide Backup

(Continued from Page 35)

ness applications under one vendor was made, she said.

Intensive Study Made

In 1973, an intensive study was made of the way the newspapers worked, and as a result of that study a request for proposal (RFP) went out, Lewis said.

The RFP reflected management's desire for a system that would grow with the papers, she noted.

Only four vendors, Univac, Telstar, Autologic and CSI, responded, and none of the systems other than the Univac seemed to have the same potential for growth, Lewis noted.

In April 1974, the twin Univac 9480 systems were installed.

Lewis was appointed systems engineer for *The Oregonian* and was the prime go-between with the assigned vendor's project team.

One of the systems is designated for business applications and the other for production using Univac Newscomp software, she explained. The twin data processing systems provide backup if one is down.

In addition to the mainframes which have 196K of core memory each, expandable to 262K, up to 58M characters of information can be put on line by each of four disk units. Thirty-nine Univac Uniscope 100 terminals using about two miles of cable provide on-line access for data entry and display, she added.

Lewis worked closely with each department at the newspapers in preparation for the new system. "In effect, each department wrote the manual for how they would 'use' the system," she said. "A key to success, we felt, was using our existing staff instead of training computer people."

Classified advertising for *The Journal* was converted in July 1974 and the following fall, editorial copy was added. Then, at the start of 1975, classified copy for *The Oregonian* was added, followed later by editorial and display advertising.

By the end of this year, plans call for Associated Press (AP) and United Press International (UPI) copy to be entered into the system's memory for editing by display terminals, she added.

The system designated for business applications was put to use for all of the circulation-related programs, including production scheduling, the printing of mailing and bundle labels, payroll and expense accounting, market research, transient advertising, media reports and credit checking, Lewis said.

Classified Ads

In all, around two million classified ads are set a year, and about 85% of these appear in *The Oregonian*, according to Max Taylor, classified ad manager.

"We shortened the deadline for getting classified ads into print considerably, reduced errors in typesetting and also speeded correction," he said.

The great majority of ads are taken by telephone. When they receive orders, sales personnel type the information on a form.

"We had to do some training to get them to ask questions in the proper order," Taylor said. "However, the result is that we are getting more accurate and complete information in less time."

Completed orders are placed on a conveyor belt, which carries them to a central desk where they are checked and batched and sent to the composing room by pneumatic tube.

Three scanners, each capable of reading and putting up to 1,800 characters of information per second onto disk memory, are used, Taylor said.

When it is complete, the system will check the classified advertising accounts receivable file to see if there are any outstanding bills owed by the advertiser, he explained.

'Reads' Instructions

The system also "reads" the instructions to see if the ad is coded for special headline or copy type sizes, he noted.

Periodically, the classified department calls up the ads scheduled for that day for proofreading on terminals. After corrections are made through the terminal keyboard and verified on the screen, the ads are released for printing.

Safeguard Against Tape Losses

Three Autologic, Inc. APS-4 phototypesetters set both headline and body type. Two of the machines are on-line. The third, used as backup, can read information from punched paper or magnetic tape, Lewis said.

The exposed paper film is fed into a darkroom in strips up to 10 feet long. At that point, the strip is automatically cut and dropped into a hopper.

The comparative short lengths are used to safeguard against losses in one of the two Loge paper film processors, she explained.

"Nothing is purged from computer memory until the next morning," Lewis commented. "However, the short length makes it easier for us to determine what has to be reprinted if one of the film processors does 'eat' something."

The processors feed the paper film print into the composing room. The classified ads are typeset by section, in order by content or ad length.

"We try to get one classified page at a time into the composing room," Lewis said.

It takes about 10 minutes for a reporter's story to get into the system. Reporter's copy is sent to the composing room by tube, where it is fed to scanners. Then, the original hard copy is returned to the proper editorial desk, Lewis explained. Each of the newspapers has set up its own method for editing by Uniscope 100 visual display terminals, she said. One is relying mainly on a copy desk equipped with display terminals and the other on section editors.

Last Minute Editing

A small percent of the editorial copy comes in on too tight a deadline to feed through the scanners. In these instances, the story can be written on a display terminal keyboard and the reporter can view the copy on the screen as it is done and edit his own copy, she said.

In either case, editors can call up stories through the keyboard of the display terminal. (Neither newspaper can use the terminals to view the other's copy.)

Newsroom terminals cannot view or access ad copy; only control display terminals in the machine rooms can access or change copy in all areas of the system, she explained.

The copy is displayed on the terminal screen and editing is done on the keyboard. When a story is edited and ready for release, this is indicated by placing a release status character in a field associated with the story identification.

Until a story is marked for release, it is stored in memory for Sunday or later use, Lewis noted. Periodically throughout the day, released stories are batched, mainly by page, and transmitted to a phototypesetter.

Dr. Dixon Doll will show you how to plan and manage effective data communications systems.

Data communications has become a focal point for new growth, and new economies, in computer use. But there are many hazards for the user. Even many up-and-running systems have costly flaws that can be improved through better management methods. And that's where these seminars come in.
Computerworld has sponsored Dr. Dixon Doll's two seminars on data communications because step-by-step, they give you the practical information you need to evaluate data communications networks and use them effectively.

1. Data Communications Course #1010 — Practical Data Communications Systems and Concepts. Led by Dr. Dixon Doll, this two-day seminar is designed for people who are relatively new to data communications. It presents you with a comprehensive exposure to the important terminology, economic aspects, and functional characteristics of contemporary data communications devices, techniques and systems. Money-saving ideas are an important part of this seminar, and you will see how to implement them using innovative techniques like split-stream modems, diagnostics for fault isolation, modem-sharing devices and digital bridges, remote multiplexers/concentrators, and front-end preprocessors. The seminar will focus on the latest developments in data communications, such as SDLC, IBM's new Synchronous Data Link Control, DDS, Bell's new digital data network, and HID-LoD, Bell's newly effective tariff for voice lines. And we'll look at the impact of satellite carriers and specialized carriers as well. This seminar will give you the ability to recognize and solve specific problems in data communications so that you can effect cost savings and performance improvements at your installation.

2. Data Communications Course #1020 — Advanced Teleprocessing Systems Analysis and Design. Course 1020 will give you an in-depth familiarity with techniques for planning, designing and managing cost-effective commercial data communications networks. Close study and discussion of specific telecommunications problems affecting your organization is an important part of this three-day seminar, and you'll have the opportunity to present such problems for analysis by the instructor and class members. You will also participate in project teams assigned to individual data network case studies, and you'll see what approaches have been taken by other organizations with networking problems similar to your own.
Like Course 1010, this seminar will focus on recent developments in data communications. But Course 1020 will concentrate on greater depth and detail. It assumes that attendees are already involved with and experienced in data communications networks, and that they desire very detailed knowledge in the field. Emphasis will be placed on thoroughly examining contemporary cost-reduction networking ideas, along with specific procedures for implementing them. Design problems associated with terminal selection and line organization will be addressed in detail as they apply to recent developments like SDLC, satellite transmission and integrated multiapplication nets. Algorithms for determining line speeds, number of ports the optimum mix of WATS and DDD for switched nets will also be examined. This seminar will give you the ability to perform your own design calculations, and it will enable you to recognize areas in present (or proposed) systems where cost savings are possible. And you will gain practical mastery of the techniques you need to realize these savings.

Dr. Dixon R. Doll is the Seminar Leader

Dixon R. Doll received his B.S. degree in Electrical Engineering (Cum Laude) from Kansas State University, and as a National Science Foundation Scholar he received his M.S.E. in Electrical Engineering and PhD in Systems Engineering from the University of Michigan. Dr. Doll has extensive experience with equipment vendors and users. He is the principal architect of the Communications Network Configurator, a family of computer programs used by the Raytheon Data Systems Company to design and analyze end-user computer-communications networks. As Head of DMW Telecommunications Corporation, which he founded, he designed Household Finance Corporation's North American Orbit network, involving more than 2700 terminals and 10 concentrators throughout the U.S. and Canada. He has developed teleprocessing network analysis software for many other major organizations, including Burroughs Corporation, IT&T, MCI, Procter & Gamble, Sun Oil, Texas Instruments and VWR Scientific Corporation. He is also a visiting staff member at the IBM Research Systems Institute in New York, where he teaches courses on data communications fundamentals, teleprocessing network design and resource sharing computer networks. Dr. Doll, a founder and Technical Director of the International Communications Corporation's ICC Institute in Miami, will lead the entire seminar.

Charges and Enrollment

The charge for Course 1010, a two-day seminar, is $350 per registrant, and $300 for additional registrants from the same company. The charge for Course 1020, a three-day seminar, is $450 per registrant, and $400 for each additional registrant from the same company. Both seminars include continental breakfasts, luncheons and all course materials at no extra charge. Hotel rooms, if necessary, are not included, but we have reserved space at the seminar hotels for attendees who wish them.

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IPS 8000 Line Printers Fit IBM 360/370 Systems

HOUSTON – The IPS 8000 Series of line printers from Information Products Systems is compatible with IBM 360/370 mainframes, the firm said.

Operating at either 1400 line/min for 132-column widths or 2,400 line/min for 80 columns, the systems feature print/paper advance speeds of 233 in./min or 400 in./min respectively, the firm noted.

Featuring an electrostatic printing method which uses a double row of stylii and a 7 by 9 dot matrix, the printer is said to contain only three moving parts.

It can accommodate 14 and one-half inch or eight and one-half inch paper, the company added.

The printers interface directly to either the IBM multiplexer channel or the IBM selector channel. IBM hardware emulation allows the system to drive the printer as a standard device.

The printers cost $12,000 or $42/mo on a 36-month lease, the firm said from 6565 Rookin, Houston, Texas 77074.

Recognition Introduces OCR Wand

DALLAS – Recognition Products, Inc. (RPI) has a hand-held optical character recognition (OCR) wand said to offer direct keyboard compatibility with most intelligent communications terminals.

The Class P130 OCR wand is designed to automatically enter human-readable source data into distributed DP terminals such as the IBM 3270, according to an RPI spokesman.

A Class 120 wand is also available to interface with intelligent terminals, modems and computers that are compatible with RS-232C communications links, he said.

Typical P130 applications are expected to be in manufacturing and accounting and inventory control, piecework payroll accounting and shipping and distribution, he said.

The wand reads machine-printed, human-readable alphanumeric characters produced either in the OCR-A-type or the OCR-B-type font.

Whichever font is used, all output from the wand is computer-compatible, he added.

Data is input through the devices at speeds of 30- to 130 char./sec, with less than one error for every 10,000 characters scanned, he claimed.

Moreover, the P130 has built-in check digit verification to free the host system from data editing tasks normally required by performing those functions at the terminal, he indicated.

The P130 OCR wand costs $2,750 from the firm at P.O. Box 22307, Dallas, Texas 75222.

Amdahl Pact Affects Users

(Continued from Page 35)

and other equipment vendors at these sites have been good, according to Amdahl.

In cases where users have retained IBM peripheral subsystems with their 470 CPU, Amdahl field representatives are running IBM diagnostics for the peripherals.

The Amdahl maintenance staffs work side by side with both IBM and other equipment representatives with a minimum of finger-pointing situations, he said.

In two cases where a problem arose concerning the reason for equipment malfunction, it was mutually agreed the IBM peripherals had caused the problem, Amdahl said.

Amdahl is developing additional hardware offerings including at least three "models" that might be offered in the future, Amdahl said.

His company will continue to concentrate on the 370/158 and larger class of users because this type of customer has the in-house expertise to objectively evaluate the increased performance offered by a 470-type processor, he said.

Future products from Amdahl and IBM will be more evolutionary than revolutionary, Amdahl predicted. He cited the IBM attached processor for the Model 158 as an example of the approach.

The 158 users have invested $200 billion in software, training and other non-CPU costs which would make a major architectural equipment change prohibitive, he said.

The trauma associated with implementation of new products has to be kept minimal if they are going to find user acceptance, he said.

The slow conversion of IBM OS/MVT users to MVS is an example of users not wanting to put up with trauma to upgrade their systems, he said, adding that is why Amdahl will concentrate on future products that are transparent to users.

The aftermarket value of Amdahl equipment in several years will be strong and users will base the value of this equipment on the relative performance which the CPUs can provide. Because of this, used 470 CPUs will be valued about one-third higher than comparable Model 168s from IBM, he predicted.

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CONTROL DATA
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County Expects to Save $600,000 With COM Facility

FORT MYERS, Fla. – Lee County expects to save about $600,000 in 10 years with a centralized microfilm/computer output microfilm (COM) facility, according to the director of the micrographics center.

The facility is responsible for a project called Leecon which provides emergency agencies with the locational details needed for their work. Law enforcement, fire, civil defense and other agencies access detailed maps, aerials and drawings which pinpoint such things as oil storage tanks and fire escapes on public buildings.

Leecon is only one of a number of new microfilm programs which is providing improved community services while simultaneously saving tax dollars.

The Lee County Micrographics Center was established in October 1975 to help 35 county departments increase their efficiency through improved recordkeeping. Eliminating the high cost of processing, storing and locating paper records is a large part of the center's job, according to its director, Philip Needles.

The center was created two years after Sal Geraci, clerk of the circuit court, proved microfilm could provide faster records access at a reduced cost, Needles said. In 1972, the cost of producing county land records in bound paper volumes was more than $15,000.

The following year, when Geraci modernized the recordkeeping system, production of the microfilm equivalent cost $1,227 – or about 8% of the paper production budget. Now the space equivalent of 70 record books is stored in magazines as compared with two of the former paper record books.

Within 10 years, the clerk's microfilming program will save taxpayers an estimated $600,000 in labor, materials and storage costs, Needles said.

Savings Investigation

This prompted the county to investigate what savings might be possible with a county micrographics center. An in-depth study indicated the county was devoting more space to storing records than it was to housing personnel; with building costs at $52 per square foot and many departments running out of space, the need for microfilm was clear, Needles said.

"By centralizing microfilming operations for 35 departments, we've been able to do much more for less money," he added. "Instead of buying nine microfilmers for individual departments, we can do the work with one camera. We can also justify specialized equipment which many departments need but can't afford as individual units."

Before the center was formed, the engineering, transportation, zoning, building and utilities departments had difficulty storing thousands of engineering drawings and oversize documents.

Now these departments have access to an Eastman Kodak Co. Model MRG-1 Recordak Micro-File machine, designed especially for this type of microfilming.

For other departments heavily dependent on DP, on-line computer storage was the only way to keep frequently needed information available for quick access, Needles said. COM produced directly has been a big help; almost any document can be found in less than 15 seconds.

"In some cases, [COM] can substitute for on-line computer storage of information," said Barry Haefele, the center's COM systems analyst. "The cost of on-line computer storage is about 10 times greater than [COM]."

HEW Program Participant

COM also is enabling the county to participate in the Department of Health, Education and Welfare's (HEW) Poisindex program. HEW is sending the county a computer tape which gives brand-name listings of all poisons and toxic materials and the measures to be taken if one of these poisons is accidentally ingested, according to Haefele.

The KOM-80 microfilmer is being used to convert this tape to microfilm coded for instant access. The same dispatchers who have the Leecon microfilm will also have Poisindex, he added.

Graphic hardcopy output from IBM systems: the Plotmaster® makes it a reality, not a dream.

If you have an IBM System 360/370 computer operating under DOS, OS or VS, you know what a nightmare it is to get graphic hardcopy output.

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For a free brochure, write Gould Inc., Instrument Systems Division, 3631 Perkins Ave., Cleveland, Ohio 44114. Or Gould Advance Ltd., Raynham Road, Bishop Stortford, Herts, United Kingdom. Or call Gould toll-free at (800) 325-6400, Ext. 77. In Missouri: (800) 342-6600.

GOULD
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HI Introduces Digital Plotter

AUSTIN, Texas – A 36-in. wide digital plotter for on-line and off-line time-sharing and remote batch graphics has been introduced by Houston Instrument (HI).

Dubbed the "Quiet One," the DP-853 operates without noise from paper movement, pen action or other sources, HI claimed.

The unit features three pens, nine switch-selectable step sizes ranging from .00125 in. to .01 in., positive paper feed and a plotting speed of up to 4.5 in./sec, the company said.

Applications include control mapping, subdivision plats and printed circuit board design. The unit costs $9,500 from HI at One Houston Sq., 8500 Cameron Road, Austin, Texas 78753.

HIS Hikes Some Rental Prices

WALTHAM, Mass. – Honeywell Information Systems, Inc. (HIS) has increased its monthly rental prices up to 7% on selected small system equipment, including the Series 60 Level 62 CPUs. The hikes are effective Nov. 1 for new equipment and Feb. 1 for existing systems.

The increases were the "result of a normal business review," according to an HIS spokesman. They are subject to existing contractual limitations including price escalation provisions, he noted.

Monthly rental for the Series 60 Level 62 CPUs was increased 4.5%. Central control units, selected peripheral equipment and non-standard products in the Keyplex key-to-disk line were also increased.

The full 7% increase in rental prices affects the System 700 minicomputer CPU and memory; Datanet 700 communications system CPU and selected peripherals; Series 16 models 316 and 516 CPUs and all peripherals; Series 1640 models 1642, 1644, 1646 and 1648 CPUs and all related peripherals; all non-standard customized products in the System 700 and Series 16 lines; and the Series 60 Level 62 PRU400 printer.

A configuration consisting of a Series 60 62/40 with 81K of memory, 160M bytes of disk storage, a 600 line/min printer and 300 card/min card reader now costs $3,723/mo compared with $3,648/mo previously on a one-year contract. Only the CPU and memory prices were increased, the company noted.

System 700

A System 700 configuration consisting of the processor with 16K of memory, 2.5M words of cartridge disk storage, 300 card/min reader, 300 line/min printer and a teletypewriter now costs $1,841/mo on a one-year plan compared with $1,806/mo previously.

The Series 16 Model 316 CPU with 16K of memory, 1.8M words of disk, 300 line/min printer, teletypewriter and paper tape reader is now priced at $3,855/mo on a one-year plan. Formerly it cost $3,602.

A 516 system with the same configuration previously cost $5,067/mo but now costs $5,422/mo on the same plan, HIS said.

The Datanet 700 processor with 16K of memory, 5M words of disk, 300 card/min reader, 300 line/min printer, teletypewriter and synchronous single-line controller was $2,046/mo but now costs $2,082/mo on the one-year plan. Only the CPU and memory prices were increased for this syatem, HIS said.

In Not-Too-Distant Future

Maintenance Seen Equaling System Cost

By Esther Surden
Of the CW Staff

SAN FRANCISCO – At some point in the not-too-distant future, the cost of minicomputer maintenance will equal the price of the system, Tom Winker of Hewlett-Packard Co. warned a recent conference here.

"Typical hardware is decreasing in price at about 30% per year," he said, while the cost of maintenance is increasing.

"Today the average service cost runs about 10% per year of the average cost of the system," he added.

One way to decrease service costs to the user is through system design, according to Stan Tenold of Rolm Corp. "You need to be able to isolate to a module level," he said.

Most of today's systems are microprogrammed, so if micro-level diagnostics are located in the micro store, they can be called up to tell which module is inoperative, Tenold said.

Error Correction

Error correction, another feature developed to lower maintenance costs, is very expensive, he told a session at the Mini/Micro Conference and Exposition. "It can be beneficial, but it is costly," he said.

Designers could help make parts gone awry easier to locate, Les Daley of ESL, Inc. commented. "In the memory, it would be nice if you could figure out the module that was bad," he said.

Users who switch from a mainframe to a mini will have to get used to a whole new pattern of service calls, Winker said. "Minis still require preventive maintenance at one- or two-month intervals, but I think users will see the manufacturers put a little better components into the syatem so the serviceperson will only have to do something when he's out firing down a system," he predicted.

To keep down costa "we have to look at new techniques that are truly portable," Winker said.

Better Diagnostics Needed

"Off-line diagnostics have to be improved so servicepeople do not have to carry around more test equipment," Bob Berdan of Measurex Corp. added. His firm is in the process control area and must minimize its systems' downtime, he noted.

"The general consensus is that we will be looking to get down into the [component level], but you run into trouble training the customer engineers," he said.

Disagreeing with Berdan, Ron Garrison of Four-Phase Systems said his firm could never provide maintenance to the component level. "We have to view it as 'What do our users expect and what will they pay for?' "

User-Loaded Diagnostica

The real key to maintenance will be user-loaded diagnostics, Garrison added. This will allow the system to be tapped by a larger system and analyzed easily.

Responding to a comment from the audience that mini makers don't seem to run replaced boards through the same quality control process as new boards, Wicker said, "If I were buying a new computer, the first thing I'd do is have my service engineer replace the brand new boards with exchange boards. They have a lot of life built into them."

The problem of maintenance is broad, Wicker concluded. "We have a wide range of users and many of those don't even want to open a door [to the computer]," he said.

STC Supermini Tape Subsystem Features 6,250 Bit/In. Rate

LOUISVILLE, Colo. – A 6,250 bit/sec OEM minicomputer tape subsystem was recently announced by Storage Technology Corp. (STC) here.

Designed for superminis, the system provides two selectable recording densities and formats, either 1,600-bit/in. phase-encoded or 6,250- bit/in. group-encoded recording.

STC 1900 Tape Subsystem

The 1900 tape subsystem features a maximum data rate of 470K byte/sec, and offers standard error detection, single track error correction as well as a proprietary error check and read error correction capability, STC said.

The error detection and correction feature enables the system to correct multiple tracks without rereads, the company added.

"Two of the nine tracks of the tape can be corrected for errors simultaneously," an STC spokesman noted.

The tape unit itself is controlled with a microprogram which also handles the optional auto threading function. The subsystem also features hard-coated heads, digital and analog capstan control and built-in test equipment, he added.

The subsystem is comprised of up to four radially connected 75-in./sec tape units and a formatter/controller.

The formatter/controller unit remains "relatively simple at the interface," the spokesman claimed. Data is presented to the interface in the same manner as is

(Continued on Page 44)

Mini, Micro Products Bow

By a CW Staff Writer

SAN FRANCISCO – Products introduced at the Mini/Micro Conference and Exposition held here recently ranged from another OEM version of an already introduced system to a *Buyer's Guide to Small Business Systems.*

The Express X from Microdata Corp. features the firm's microprogrammable CPU and is software-compatible with the rest of the Express family, a spokesman said.

It includes an IBM-compatible reel-to-reel tape transport system, 10M-byte disk drive with an IBM 5440-type removable cartridge and a Prism CRT.

It differs from the previous Express family members in that it has removable rather than fixed media, he noted.

Users can expand disk capacity to 160M bytes, he added.

A basic Express costa $19,950 from the firm at 17481 Red Hill Ave., Irvine, Calif. 92714.

Electronic Memories and Magnetics Corp. (EMM) displayed its System 800 microcomputer at the exhibit.

Described as a self-contained commercially-oriented system that contains the Intel Corp. 8080 instruction set, the system can be customized to the end user's specifications, according to a spokesman.

A basic system including 32K bytes of memory, a 5M-byte cartridge disk, CRT

(Continued on Page 44)

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PRIME

Wide Variety of Mini, Micro Products Introduced

(Continued from Page 43)

and keyboard and a 132-column 60-char./sec matrix printer costs $14,500.

It is housed in a desk enclosure and runs under a disk operating system with enhanced Basic, he said.

A basic System 800 costs $14,500, according to the spokesman.

EMM is at 12621 Chadron Ave., Hawthorne, Calif. 90250.

Console Capability Featured

General Automation, Inc. (GA) announced a virtual console for its GA-16/220 and GA-16/330 microcomputer line.

The console features extended programmer console capability via local or remote CRT or Teletype, a serial I/O port, autoload capability and lights and controls on the edge of the CPU boards, according to a spokesman.

It uses GA's Basic Utility software programmable read-only memory (Prom) package.

The Prom package provides console display and control functions as well as a set of user debugging facilities. Access to the console is through RS-232 and current loop serial I/O port with CRT, Teletype-like device or modem, he added.

The virtual console costs $380 with quantity discounts available from GA at 1055 South East Street, Anaheim, Calif. 92805.

Pertec Computer Corp. introduced a dual floppy disk system for OEM microcomputer makers.

Designed for auxiliary storage in OEM systems, the Icom FD3712 features Pertec's FD500 flexible disk drive and an Icom controller/formatter available with plug-compatible interface to various microprocessors, a spokesman stated.

It offers IBM 3740 format and media compatibility and is suited for either rack mounting or desk-top use without modification, he explained.

The unit costs less than $2,000 with cables in 100-unit quantities, he said.

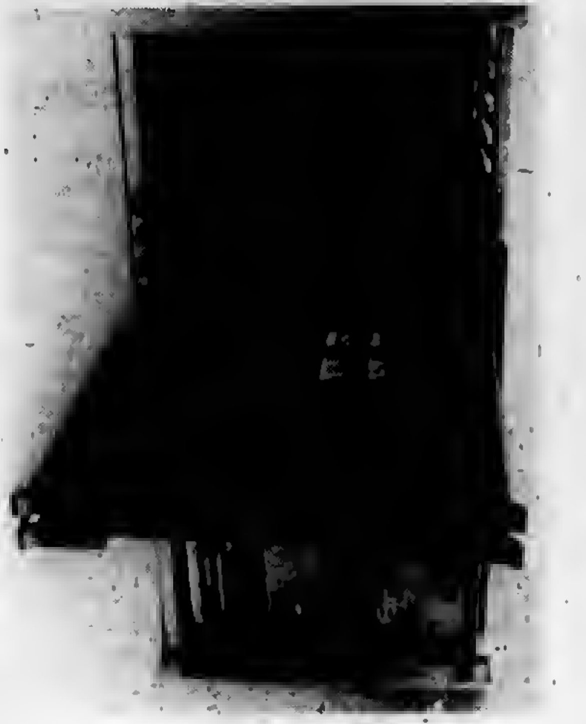
Pertec is at 6741 Variel Ave., Canoga Park, Calif. 91303.

More Interface Flexibility

At the Emerson Electric Co. booth, the firm displayed its Model 2060 RS-232C interface, offered as an option with the firm's 2000 Series Tape Pac recorder systems.

Built around an Intel Corp. 8080A CPU, the interface has two 200-character 8-bit buffers and a random-access memory that provides 50 bytes of storage for software and housekeeping functions, a spokesman said.

Designed to provide users with more interface flexibility, the unit has a 9,600 bit/sec throughput rate and can "write unlimited block lengths from a wide variety of input formulas," he said.


GA Virtual Console

The 2060 costs $1,000 from the Industrial Controls Division, 3300 South Standard St., Santa Ana, Calif. 92702.

The *Buyer's Guide to Business Minicomputer Systems* from Auerbach Publishers, Inc. is designed "for the user or analyst who will be selecting a business system within the next six months," a spokeswoman said.

The single-volume loose-leaf book includes product reports and analysis of systems available in the U.S. from both domestic and European manufacturers.

The Winter 1976-77 issue costs $59; together, the Winter and Fall 1977 issues cost $99 from Auerbach at 6560 N. Park Drive, Pennsauken, N.J. 08109.

Persci Introduces Diskette Controller

MARINA DEL REY, Calif. – An "intelligent" diskette-drive controller for microcomputer systems has been introduced by Persci, Inc.

Designed to interface most major microcomputers, the Model 1070 diskette-drive controller incorporates an Intel Corp. 8080-type microprocessor with internal disk operating software for all file management functions including IBM 3740 formatting and initializing, the firm said.

By command of the 1070, data transfer can be accomplished between the drive and the CPU interface or to and from an optional RS-232 interface.

ROM options to the controller allow copy data transfer between diskettes.

The complete Persci diskette-drive subsystem includes the Model 1070 controller, interface, cabling and from one to four Model 70 diskette drives or one to two Model 270 dual diskette drives.

The Model 70 subsystem costs $1,195; the Model 270 dual-capacity subsystem costs $1,495.

Persci is at 4087 Glencoe Ave., Marina del Rey, Calif. 90291.

Mini Tape Subsystem Runs at 6,250 Bit/In.

(Continued from Page 43)

common in existing NRZI or PE formatters, he noted.

Provision for adaptation logic has been made and several unused slots in the formatter/controllers will be used as spares with power and grounding already included, the firm noted.

The 1900 will be available in May 1977. It costs $6,400 for the manual load unit or $6,800 for the automatic threading unit in 100 unit quantities. The formatter controller costs $6,580.

STC is at 2270 S. 88 St., Louisville, Colo. 80027.

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Advances in Minis Credited With Advances in Printers

By Esther Surden
Of the CW Staff

SAN FRANCISCO – As technology expanded the capabilities of small systems, the need for higher speed, less expensive printers became apparent, according to Mel Posin, vice-president of marketing at Printronix.

An increasingly broad range of applications made possible by minicomputers also increased the need for better output devices, Posin said here recently.

Before the rapid advance of minicomputer technology, small systems were used primarily in control and scientific environments, he noted, and the need for hard-copy output could be handled by Teletype-like devices with rates of 10- or 20 char./sec.

"The mechanical font 'stroke-at-a-time' teletypewriter printer was operating at or near its physical and mechanical limitations," Posin recalled, and the only available option for users was to go to the costly drum/chain-type printer that had been used with mainframes.

But "their price still was substantially greater than could be justified for the applications under consideration."

A device faster than a teletypewriter and slower than a conventional line printer was needed, so the matrix printer came in to fill the gap, Posin stated.

The serial character matrix printer featured a mechanism that replaced the moving typewriter print head with a dot matrix head that moved back and forth on the carriage, placing discrete dots on the paper.

The serial matrix printer operated at about 100- or 200 char./sec and cost less than half of the price of the available line printers, he noted.

Continuing rapid development in the minicomputer industry, however, "kept increasing the capabilities while reducing the costs of small computers . . . and this brought with it the further requirements for higher speed, less expensive printers."

Serial matrix printers had difficulty in meeting the challenge, he added, because "there are a limited number of 'print wires' that can be crowded into the moving head and they must be physically separated as they print, giving the copy a visible dot construction of each character."

"Furthermore, they were constrained to about a 20% duty cycle since continuous use extracted a toll in early head wear and increased maintenance costs."

The idea of using a matrix technique in a line printer configuration was then developed, Posin said. With this type of printer, the impact points were spread horizontally across a line of print; speed was increased by the addition of more hammers to get the job done.

The raster printer, as it was called, also featured greater reliability because it did not use long flexible wires with guidance bearings, he said.

Matrix Printers Held Better

SAN FRANCISCO – "It is frequently felt that matrix printing is expedient – a way of building printers at a lower cost – but not necessarily the most desirable way to go. Nothing can be further from the truth," Mel Posin, vice-president of marketing for Printronix, told users here recently.

Matrix printers are easier to maintain than line printers, he said, representing a cost saving to the user.

The hammer driver circuitry is simplified because it takes less energy to produce a dot through six copies than an entire character. Smear and misregistration, which limits the speed of line printers, does not limit dot printers, he claimed.

Print quality is better with matrix printers, he claimed. As a line printer's font height decreases as a result of wear or with thick paper assemblies, a shadowing or ghosting effect appears.

The impact with matrix printers is uniform for each dot and the characters are made of varying numbers of dots, while line printers have to use the same energy to produce both a period and a "W," he said.

Since character encoding is done via read-only memory in a matrix printer, extension of character sets has no effect on throughput; a chain or drum printer capable of operating at 300 line/min with a 64-character set is slowed down to 150 line/min if the character set is increased to 128.

Another advantage of the matrix printer is noise reduction. The paper is held tightly against the platen at the point of impact so little paper motion takes place, he explained.

A matrix printer also makes about 10 times more hammer impacts than a line printer, but with 10% of the energy per impact, resulting in higher noise frequencies that are easier damped, he concluded.

IST Has Turnkey for Businesses

MEMPHIS, Tenn. – The Unique Transaction Processing System (TPS) is a turnkey minicomputer system based on either Data General (DG) Nova or Eclipse minicomputers, according to its vendor, IST Datasystems.

A typical configuration includes a Nova 3/D with 64K words of memory, communications interfaces, 10M bytes of disk, 800- or 1,600 bit/in. magnetic tape, a 300 line/min printer, 15 CRTs and the TPS software.

Running under DG's Mapped Real-Time Disk Operating System, the system provides multitasking foreground/background control for multiterminal, transaction-oriented business DP applications, the firm said.

Applications programs scheduled under foreground control are executed independently in the background while multiterminal, interactive data entry and data base inquiry or update operate in foreground, the company noted.

All existing DG software can be incorporated within the TPS, with background written in any DG language. Standard and custom communications protocol can also be provided, the company claimed.

A text editor option incorporates a version of the DG multiterminal edit (Medit) into the TPS foreground to allow a terminal to switch from transaction processing to text editing, permitting concurrent multiterminal program development.

The typical configuration costs $98,000, IST added from 2985 Vanguard Drive, Memphis, Tenn. 38131.

Formatter Handles Trident Disks

ANAHEIM, Calif. – California Computer Products, Inc. (Calcomp) has announced the OEM 1150A formatter which is said to allow the control and formatting of up to eight Trident disk drives in any mix of capacities.

The Trident family consists of five disk drives with capacities of 25M-, 50M-, 80M-, 200M- and 300M bytes.

The formatter incorporates such features as hardware error correction code, rotational position sensing, variable sector lengths, multisector transfers and extended micro diagnostics, the firm said.

The 1150A can be attached to any mini- or microcomputer by means of a universal CPU interface that permits insertion of a user-designed printed circuit board, the company noted. The formatter occupies 3.5 in. of a standard 19-in. mount.

Incompatibility in disk and central processor data transfer rates is eliminated via data buffering up to 4K bytes and throughput is increased with overlapped seeks for up to eight Trident drives.

The 1150A costs $5,400. Calcomp is at 211 W. La Palma Ave., Anaheim, Calif. 92801.

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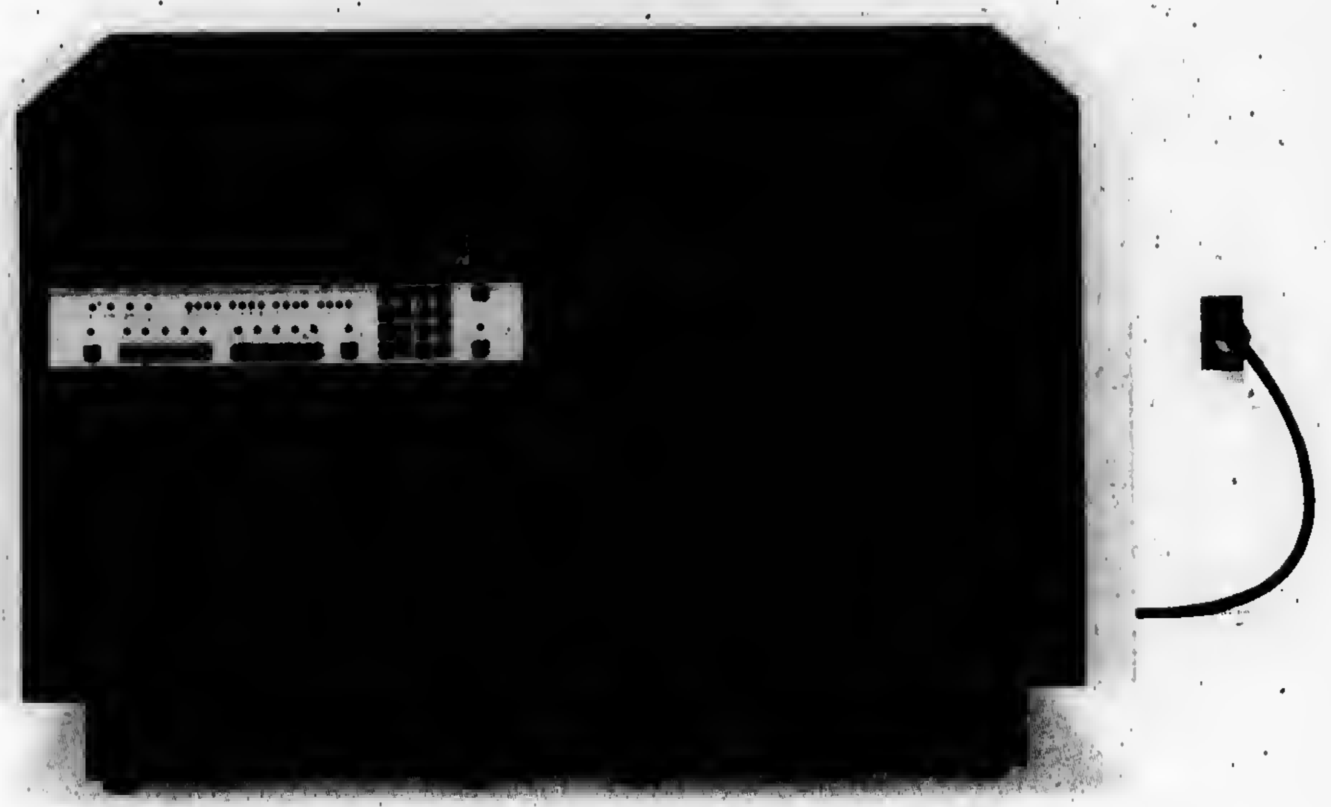

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CI Notes

CDC Sales to China, USSR Approved by White House

WASHINGTON, D.C. – The White House has approved the sale of two Control Data Corp. Cyber 172 systems to Red China and one Cyber 73 to the Soviet Union for use in oil exploration and earthquake detection.

The systems are "totally equivalent packages in terms of capability and the use to which they will be put," according to a CDC spokesman.

Both were sold in cooperation with Compagnie Generale de Geophysique (CGG) of France, a firm that specializes in oil exploration software and physical equipment. The French firm does not sell any computer hardware, the CDC spokesman noted.

The Ford administration decided the multimillion dollar systems sales "won't be detrimental to national security" and are "consistent with U.S. foreign policy interests," Commerce Department sources said.

The safeguards imposed on the two sales are "the same in all practical aspects," the CDC spokesman said. To assure the systems will be used for the purpose detailed in the original contract, the government is requiring one person to accompany the systems to each site and monitor their use for a period of two to three years.

This is "no different in any way from the installations we already have" in Poland, the Soviet Union and Yugoslavia, the spokesman said.

The deal now faces scrutiny by Cocom, an organization of Japan and the North Atlantic Treaty Organization nations except for Iceland.

Broomall Licensing Plotter Patent

BROOMALL, Pa. – Broomall Industries, Inc. has revealed it holds the exclusive rights to a technique developed by Mourier which is presently used by many manufacturers in nearly all larger-size drum plotters.

The patent, No. 3,305,873, is available for licensing at a "reasonable" royalty, according to Andrew Trolio, Broomall president.

The availability of the patent license should be of particular interest to companies that manufacture and sell drum plotters, he said.

Feared Antitrust Action

IBM Foresaw Inevitability of Unbundling

By E. Drake Lundell Jr.
Of the CW Staff

NEW YORK – More than six months before IBM unbundled certain software and services in June 1969, the firm had concluded there was no legal defense for keeping those services bundled, according to a document entered into the U.S. vs. IBM antitrust trial here.

The one-page chart, which indicated the firm was vulnerable to user antitrust suits in several areas, is one of the more than 23,000 documents the firm has unsuccessfully tried to keep out of the court record for the past four years.

The document found the firm would have "certain" exposure to treble damage antitrust suits from users that could cost it millions of dollars if it did not unbundle some programs and services.

IBM Trial Documents

Part of a study called CS&M III (standing for the third study done for IBM's outside lawyers, Cravath, Swaine and Moore), the document said there was no defense for keeping "Systems Engineering Guidance-Consult-Implementation" services bundled with the price of hardware.

In this category alone, the firm faced "certain and very significant exposure to treble damage payments (hundreds of $millions)," according to the document.

In June of 1969, the firm began to separately price these systems engineering services; they previously had been part of the price of IBM hardware.

The document was prepared under the direction of "HAF", or Hillary A. Faw, an IBM employee who worked closely with the lawyers during this time period (December 1968) – which was even before the U.S. government filed its antitrust suit against the firm.

Besides the risk of continuing to bundle systems engineering services, the document said the firm would have a "poor defense" against suits if it continued to bundle Type II programs and education services.

In this area, the document said the firm would face "certain" – later crossed out and changed to "probable" – "exposure to treble damage payments," but noted it would be "difficult to prove damages" in this area.

On the whole, it said, the damages would "probably not [be] great in dollar amount (say 10's of $millions),"

The firm unbundled Type II programs and education services in its June announcement.

The document also noted the firm successfully defended itself in the area of field engineering and maintenance services when the government had previously

(Continued on Page 48)

Federal Home Loan Banks Appeal Ruling Prohibiting DP Services

By Toni Wiseman
Of the CW Staff

ST. LOUIS – The issue of whether federal home loan banks can provide computer services to savings and loan associations has not been settled.

An appeal has been granted on a recent ruling by Federal Judge Carl B. Rubin that federal home loan banks cannot provide DP services to savings and loans. The case will be heard in the appeals court here.

The appellants, federal home loan banks in Cincinnati, New York, Chicago, Pittsburgh and Des Moines, made the motion in conjunction with the Federal Home Loan Bank Board (FHLBB).

The original case was brought by the Association of Data Processing Service Organizations (Adapso) and United Data Processing, Inc., against the FHLBB and a Cincinnati bank in October 1973.

The four appellant banks later joined the suit as intervenors [CW, Nov. 14, 1973]. Rubin ruled in favor of Adapso last month.

Jerry Dreyer, executive vice-president of Adapso, said the association is prepared to proceed with the appeal and is "very confident."

In its suit, Adapso contended federal home loan banks' exemption from taxation "constitutes a form of unfair competition." It also charged that under the Home Loan Bank Act of 1932 these institutions are barred from participating in nonbanking commercial activities such as computer service centers.

In October 1970, the FHLBB issued Resolution 70-327 permitting federal home loan banks to provide on-line savings, mortgage and general ledger DP services with the provision that "such services shall be provided only if acceptable comparable services are not otherwise conveniently available to member institutions."

In January 1972, Resolution 70-327 was rescinded and in its place Resolution 72-186 was adopted. The replacement resolution did not limit the offering of

(Continued on Page 52)

DA Returns Valcomp's Hardware

LOS ANGELES – The district attorney's (DA) office here has returned to Valcomp Co. the various pieces of hardware it confiscated last summer under a search warrant.

A warrant to search Valcomp's premises was obtained after Xerox Corp. reported it was missing inventory and police obtained indications pieces might be found there [CW, Aug. 30].

The DA's office "does not at this time feel Valcomp as a corporation is involved in the alleged theft of parts" from Xerox Corp.'s El Segundo facilities, according to a spokesman for the DA. However, an investigation of certain former and present Valcomp employees as well as other individuals is continuing, he said.

According to the search warrant used by the DA's office in its efforts to assist the El Segundo police, there were sales of equipment by Xerox employees to Valcomp employees.

A spokesman for Tymshare, of which Valcomp is a subsidiary, said none of the alleged missing inventory from Xerox was discovered at Valcomp. What the search uncovered, he said, were pieces acquired by Valcomp in the normal course of business.

Tymshare went to court to recover the parts seized during the search.

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F&S Predicts Recession-Recovery Cycle for Semi Sales

By Toni Wiseman
Of the CW Staff

NEW YORK – U.S. semiconductor sales are expected to recover almost to the 1974 level this year after a severe recession, according to a recent report by Frost & Sullivan, Inc. (F&S).

But "forecasters who study long-range business cycles see the possibility of another recession beginning in late 1978 and continuing through 1979," the market research firm noted.

Sales of semiconductors by U.S. manufacturers declined in 1975 to $2.15 billion from over $2.9 billion a year earlier. This year's sales should just top $2.8 billion, F&S said, and reach $3.5 billion in 1977 and $4.1 billion in 1978.

Semiconductor sales "can drop to $3.7 billion in 1979 and then spring back sharply to over $4.6 billion in 1980. A longer range projection for 1984 shows semiconductor sales topping $5.1 billion," the report stated.

Semiconductor manufacturers are expected to compete head-on with the minicomputer manufacturers and possibly even the large mainframe houses with the new microcomputers which are going into high volume production during 1976.

"By the end of the decade – or sooner – it is very likely all the elements of a 16-bit microcomputer will be on a single chip of silicon. This could obsolete the minicomputer business," F&S said.

Discrete semiconductors, the big sellers during the 1950s and 1960s, have been obsoleted by integrated circuits. The growth of the industry will therefore be dependent on sales of newer integrated circuits, such as extremely complex microprocessors and high-density semiconductor memories, according to the report.

"Despite the lucrative opportunities in the semiconductor industry, it is not easy for a company to be extremely successful," F&S said.

"During the recent recession, three companies were forced to close their doors as a result of lack of cash flow. Inselek, Siltek and Microsystems International were all involved in the state-of-the-art MOS technology," the report noted, adding that even Signetics, the fifth largest U.S. semiconductor manufacturer, ran into severe financial problems in 1975.

Between early 1974 and late 1975, the average selling price of nearly every type of semiconductor declined, some as much as 80%.

"While this has severely drained the profit margins of most companies, it has also encouraged equipment manufacturers to replace older electromechanical devices and magnetic core with the newer semiconductors," the report said.

The key to success in the semiconductor industry is the ability to manufacture complex devices in extremely high volume at low cost, making semiconductors more cost-effective to the user than any other approach, F&S said.

The latest developments in MOS integrated circuits will pack 16K bits of random-access memory on one silicon chip, the study predicted. But while MOS is the technology of the mid-1970s, new techniques are quietly under development in the research laboratories of many companies which may one day obsolete MOS, it noted.

"New buzzwords such as 'integrated injection logic,' 'charge-coupled devices,' 'bubble memories' and 'silicon-on-sapphire' have the promise of creating winners and losers in the semiconductor industry," the report said.

Many of the leaders in the industry feel the key to their growth lies in vertical integration into the end equipment industries which use large quantities of semiconductors, F&S reported.

Texas Instruments, National Semiconductor and Fairchild Camera & Instruments, for instance, have entered the digital watch business.

Intel, formed to develop and market semiconductor memory components, has moved a step up the ladder and is now offering semiconductor memory systems which are manufactured by assembling memory components. Texas Instruments and National Semi, among others, have packaged their MOS circuits and semiconductor displays and are marketing hand-held calculators.

F&S foresaw a bright outlook for the semiconductor industry during the second half of the 1970s and, while the world markets will continue to be extremely competitive, U.S. manufacturers should maintain their market share.

IBM Foresaw Need To Unbundle Systems

(Continued from Page 47)

sued it on antitrust grounds and the two parties settled out of court in 1956.

However, the defense of these practices would be "more difficult in 1969," even though the group preparing the document said there would be "unlikely exposure to treble damage payments.

"If damages are proved, dollar amounts probably [will be] small as to prior years," the group said.

Although the risk was not as great here, IBM unbundled maintenance and field engineering in June 1969.

In the area of Type I programs, the group felt IBM had a "good defense" against antitrust suits and there was an "unlikely exposure to treble damage payments."

Type I programs were not unbundled in June 1969.

In the area of marketing activities by systems engineering personnel, the group felt this was "not a tie-in problem." Such activities continued after the June 1969 unbundling announcement.

The document is part of a group IBM has been trying to keep out of the record of this case, claiming it only released the documents "inadvertently" to Control Data Corp. for use in that firm's suit against IBM.

Although the firm appealed the issue of these documents twice to the Supreme Court, that tribunal has let stand a ruling on the part of Judge David N. Edelstein, who is hearing the government's case, therefore forcing the firm to release the documents or face a contempt citation.

According to the government, the document shows "IBM evaluated the legal problems associated with its bundling practices and admitted potential liability arising from maintaining such bundling practices – admission by IBM that its bundling practices were indefensible.".

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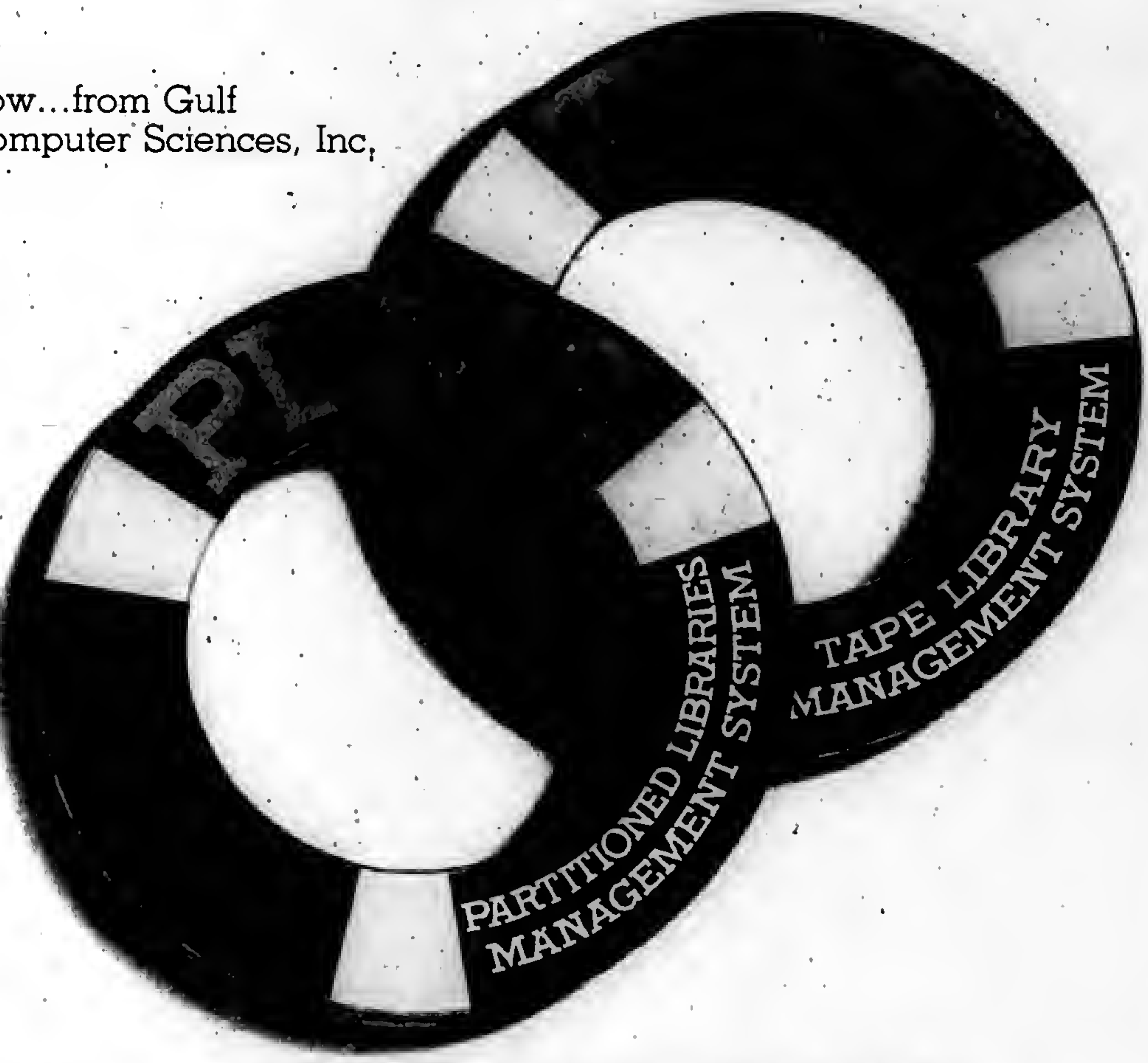
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MRI's Canadian Arm Making DBMS Foray

By Esther Surden
Of the CW Staff

MONTREAL – MRI Systems Canada Ltd. is thrusting into the Canadian marketplace with its System 2000 data base management system (DBMS) and the TP 2000 teleprocessing option.

The firm incorporated in 1974 in Canada, according to Bert Brown, vice-president and general manager of the Toronto-based firm.

The wholly-owned subsidiary of the U.S.-based MRI Systems is in the process of hiring and staffing its offices. "The office here will be patterned on the same structure as the one in the U.S.," Brown noted, but the staff will be Canadian.

"During 1975, we built up a staff of 13 and are still growing," he added.

"American companies have a very high marketing potential in Canada," Brown said. "I think it's a market many American companies underestimate; it's a sophisticated one and the level of technical expertise is very high.

Canadian Problems

"The reasons American companies avoid Canada are tax problems, customs and lack of knowledge of the market," he said.

"One of the primary problems in Canada is that it is so geographically large; installations could be scattered from Vancouver to Halifax," he added.

MRI boasts 25 installations in Canada of System 2000, a product that sells for $80,000 to $150,000. Primary customers are in the natural resources industries such as forestry and mining.

Most of the firm's customers are scattered geographically, Brown noted, with one located on the Island Victoria off the western coast of Canada.

Language Problem

Another problem specific to Canada is the French language, Brown stated. Frenchmen in Canada require communications in French, and marketing contacts must be in French.

"Every market has its own style, and every company marketing in a particular area has to accommodate that market," he said.

"We have several customers in the French market and we find them open to a good product. If you can show a good product, they will evaluate it.

"The companies in Canada seem to be less tied to IBM's apron strings than in America, more willing to evaluate. IBM's percentage is much smaller in Canada because Canadians seem to demand better products for their dollar."

DBMS Cost Justification

DBMS have reached the point where their costs can be justified in any large hardware installation, Brown said. In the past, people had to seriously consider whether to get one.

"In any large shop, the capital needed to purchase a DBMS plus the operating cost after installation equal savings. Our primary effort has been to refer future customers to customers who have been satisfied in the past," he said.

If users develop systems with traditional Cobol files, 50% of the code is used for file handling, and it is repeated in every system just a little differently each time. The DBMS can reduce the amount of coding necessary and save programming time and salary dollars, Brown indicated.

MRI provides the whole range of marketing, installation, education and technical support services in Canada, he noted. "We have a consulting staff to back up our software, so we offer the user the knowledge that he's dealing with a vendor who is responsible. The delivery of the code is only the first transaction," he said.

Pfeiffer Picked To Head Adapso

MONTVALE, N.J. – The Association of Data Processing Service Organizations (Adapso) has named Lou Pfeiffer as its president. Pfeiffer is director of marketing for A.O. Smith Corp.

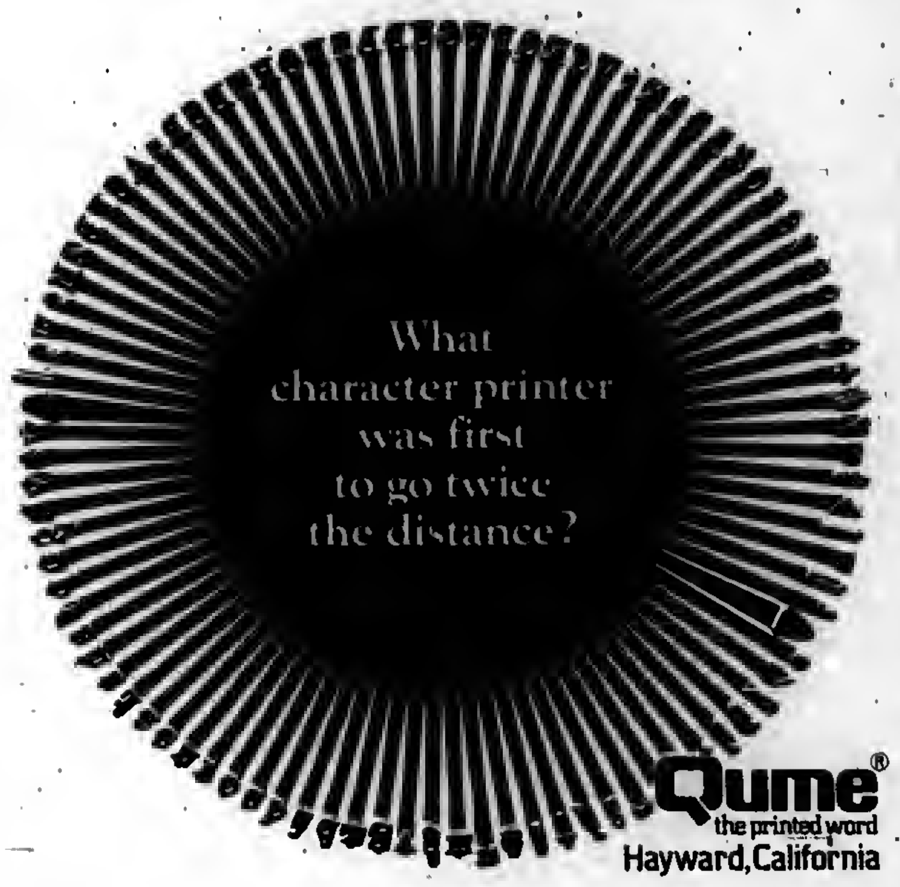
Richard Crandall, president of Comshare, Inc., is Adapso's first vice-president and John Imlai, president of Management Sciences America, Inc., is second vice-president.

Art Kramer, president of Praxa Data Centers, Inc., is treasurer for the association.

Chosen to head the Software Industry Association (SIA) segment of Adapso was Bruce Coleman, president of Boole & Babbage, Inc. Larry Schoenberg of AGS Computers, Inc. is vice-president and Burt Grad, IBM, is SIA treasurer.

New members of the board are Frank Wagner, Informatics, Inc.; John Imlai, Management Sciences America, Inc.; Wayne Warlick, Gulf Computer Sciences, Inc.; Ken Parker, Computer Information Management Co.; and Mike Harvey, University Computing Co.

Remaining on the board are Ed Horst, Comtech U.S.A.; Lloyd Baldwin, Pansophic Systems, Inc.; and Marty Goetz, Applied Data Research, Inc.



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With Fast Growth Rate

UK Services Industry Called 'Buoyant'

By Don Leavitt
Of the CW Staff

LONDON – Despite problems in the British economy – "or perhaps in part because of them" – the computing services industry "remains buoyant with one of the fastest growth rates of any UK industrial activity," according to the director general of the Computer Services Association (CSA), the British equivalent of the Association of Data Processing Service Organizations (Adapso).

Alan A. Benjamin told a recent CSA annual meeting the growth rates of individual company turnovers have ranged in the past year from 10% to 150% compared with the previous year.

The growth rate for CSA members, at about 30%, is 5% to 10% ahead of the industry average revealed by independent studies, he added.

Software houses, consultancies and remote access service bureaus lead in the growth tables, Benjamin said.

He cited an independent report which rated the UK market third in size after France and Germany (excluding the U.S.). The French and German markets are "apparently less developed," however, "judging by the number of new continental offices opened by CSA members in the year."

More than 30% of CSA's members currently have offices elsewhere in Europe, while some 10% have offices established "as far afield as Japan, the U.S. and the Middle East," Benjamin continued.

While British industry generally has come in for criticism over its lack of investment in new plants and machinery, the CSA official said "clearly the computing services industry is an exception with a record 30 million pounds plus invested in new hardware and several millions of pounds in telecommunications."

The British pound sank badly during the reporting period, but the figures mentioned by Benjamin might be doubled to provide very rough U.S. dollar equivalents, one observer said.

International
News

In any case, Benjamin added his figures "exclude all the hardware purchased as part of facilities management and turnkey contracts" which he estimated to be worth another 10 million pounds.

The user base served by the association grew as well, he said. "Nearly all" the top 1,000 largest firms in the UK make "extensive use" of CSA members, he noted, and "more than 140 clients have each spent over 100,000 pounds during the period on a variety of services."

The average client's annual spending for services ranged from 230 pounds to 50,000 pounds, he said, with the mean for bureau members at 5,000 pounds and software houses and consultancies at 11,000 pounds.

The largest known contract in the year "and a major export win in its own right" was for a turnkey operation in the Middle East valued at 24 million pounds, Benjamin added.

European Governments Studying Semiconductor Industry Feasibility

LONDON – A major multi-government-sponsored study on the feasibility and requirements of a European semiconductor industry has been initiated.

The study, which will be made by Mackintosh Consultants, will give primary emphasis to Western Europe but also encompass the U.S. and Japan.

Commissioned by the Federal Republic of Germany, the feasibility study is supported by the governments of France, The Netherlands and the UK as well as the European Commission.

The two main aims of the survey are to provide a 10-year forecast of trends in technology, products and markets for both integrated circuits and optoelectronic displays.

An analysis will then be made of the strategic factors and conditions necessary for the emergence of a successful European semiconductor capability.

The domination of European markets by U.S. manufacturers of large-scale integration (LSI) circuits and optoelectronic displays and the "generally unsuccessful competitive position" of the European semiconductor industry regarding state-of-the-art devices – "a position which deteriorates with each new wave of innovation" – has been a source of increasing concern not only to the West European semiconductor companies themselves, but also to the West European governments, according to Mackintosh Consultants.

For this reason, various programs of governmental support for the national semiconductor industries in Europe have operated for a number of years, "although to date without any significant success," the firm said.

A final report will be made in Bonn in December. It will serve both as a detailed forecast and as a guide for the development of strategy within the governments sponsoring the study, acting either singly or together, in the assessment of the present situation and future prospects of the European semiconductor industry.

House to Serve Microelectronics

READING, England – Computer Analysts and Programmers (CAP) has announced the formation of a software house to provide consulting and programming services for microelectronic devices.

Called CAP Microsoft, the house is said to be the first in Europe dedicated to providing software services to the users of microelectronic circuits, including circuit designers, manufacturers and distributors.

CAP Microsoft, like CAP, is independent from hardware suppliers. Among the services it will offer are consultancy advice on software development systems, equipment selection and evaluation exercises and courses for managers, engineers and programmers.

It will also provide exploitation of "second-generation" distributed processing networks.

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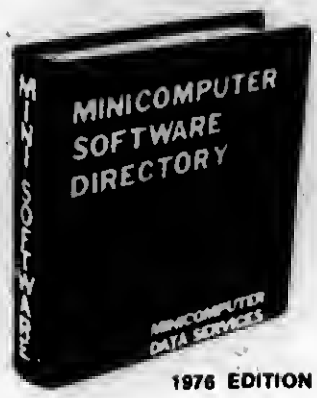

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DEC Milestone

Kenneth H. Olsen (second from right), president and chairman of the board of Digital Equipment Corp., presented the 50,000th LA36 Decwriter II terminal to (left to right) Arthur Gallo, Leasco Data Communications Corp. director of marketing, and Carl English, Leasco president. Charles M. Harter (far right), DEC terminal specialist, was also on hand.

Still in Question: DP Services From Federal Home Loan Banks

(Continued from Page 47)

services, but it did express a desire "to assure that the provision of such services will not be unduly injurious to other private entities providing such services."

While Adapso expressed concern over these DP activities as early as May 1971, the action was not filed until October 1973.

'Contrary to Law'

In his ruling, Rubin found that under the 1932 Federal Home Loan Bank Act "the providing of services to member associations is not an expressed purpose and if it exists as a valid exercise of power it must be an 'incidental' rather than an 'expressed' power.

"It is quite clear Congress intended only a limited and specific function for the federal home loan banks," Rubin said.

The judge concluded that "the providing of data processing services to member institutions is not an express power granted to the federal home loan banks or Federal Home Loan Bank Board" by the 1932 act.

He therefore ruled the authorization issued by the FHLBB "purporting to approve the data processing services of [the Federal Home Loan Bank of Cincinnati and other federal home loan banks]. . . . is illegal and void and of no force and effect by reason of being in excess of statutory authority and contrary to law."

'Victory' For Adapso

Following Rubin's ruling, Dreyer stated "it's an indication that we were involved with the specifics of the law, the Federal Home Loan Bank Act, where we said [the federal home loan banks] were in excess of their statutory power.

"Judge Rubin agreed with us and not only knocked out the Cincinnati bank, but also the intervening banks in Pittsburgh, New York, Chicago and Des Moines.

"I think it's a victory" for restricting "a government agency from passing down an edict which permitted quasi-government organizations, such as the member banks, to participate in the private sector, an argument we've been running right along," Dreyer said.

Commenting on the ramifications of the ruling, Dreyer said the important question is whether a government agency should on one hand regulate an industry and on the other hand market to that industry.

"If this was the private sector, you'd have an antitrust violation," he commented.

Orders & Installations

Volume Shoe Corp., a self-service shoe chain, has installed an NCR Criterion 8550 for a planned point-of-sale network.

The Santa Rosa (Calif.) *Press-Democrat* has ordered two Logigraphic prepress automation systems from Logicon-Intercomp, Inc., a subsidiary of Logicon, Inc.

Safeway Stores, Inc. has installed an IBM 3660 checkout system in Kansas City, Mo.

Case Western Reserve University has ordered six virtual memory systems from the Computer Systems Division of Harris Corp. to be used at service sites in a distributed network supporting over 30 minicomputers plus time-sharing and batch services.

Frigidaire, Inc. has installed 120K of memory from Business Systems Technology, Inc. at five locations.

Computer Assistance, Inc. has installed a Digital Systems Corp. Galaxy/5 distributed processing system to enhance its on-line customer services.

The U.S. Navy has ordered 28 Omnus Computer Corp. disk subsystem controllers for seven Univac 494 computers in its Uniform Inventory Control Points system.

The town of Waterford, Conn., has installed a Burroughs B700 system for budgetary accounting functions, tax billing and payroll.

Jefferson Pilot Broadcasting Co. has ordered Sycor 440 clustered terminal processing systems and printers for its customer network of radio and television stations.

Configure a winner.

A special report on *Data Communications Network Configurations* in the November 29th *Computerworld*.

Configuring a new data communications network could be one of the most demanding challenges you face in a decade. It means your DP staff -- including managers and technical specialists -- must make crucial choices on many costly items like terminals, modems, line speeds and protocols. In addition, numerous intangibles are changing the data communications environment, and your contingency preparations should encompass these. Building greater flexibility into your system to accept new sites, faster lines, more advanced equipment, etc. is one example. In sum, a data comm network means a long term capital investment for your organization. And this requires long range planning for a system that will meet your teleprocessing needs today -- and in the future.

Computerworld's November 29th issue will include a special report, edited by Ron Frank, on *Data Communications Network Configurations*. The supplement can show you some of the right ways to plan your network -- and how to avoid common pitfalls. In addition to case studies and commentary from well-informed users who understand the data communications environment with all its implications, you'll find applications stories and tutorials on the equipment, carrier services, line protocols, teleprocessing software, etc. that's available to make up your system.

So whether you're building a network or managing one, you'll find important and useful information in the November 29th *Computerworld*. And if you're marketing data communications products or services, you should advertise to your audience here. The ad closing date is November 12th. Talk to your *Computerworld* salesman for complete details. Or call Judy Milford at (617) 965-5800.

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Executive Corner

- Paul Seckendorf has been appointed vice-president of product and programming management at California Computer Products, Inc. (Calcomp).
- Dr. Peng-Siu Mei has been elected vice-president and general manager at Software and Engineering for System Automation, Inc. (Sesa).
- Charles E. Exley Jr., executive vice-president, finance and member of the board of directors, has resigned as an officer and director of Burroughs Corp.
- Robert D. Ranck has been promoted to vice-president of business development at Datatrol, Inc.
- Henry J. Stewart has been appointed vice-president of marketing for Digital Systems Corp.
- Robert G. Wallstrom has been promoted vice-president of line printer product management and support services for Dataproducts Corp.
- Richard Yung, vice-president of data processing at Market and Research Bureau, Inc., has been promoted to senior vice-president.
- Richard C. Furnival joined Telenet Communications Corp. as vice-president of operations.
- Allen Karson has been elected vice-president of marketing for Timeplex, Inc.
- Mick Liddell has been named national sales and marketing manager for World Magnetics, a subsidiary of Fairchild Camera and Instrument Corp.
- Milton Schwartz, Winfield Shiras and Thomas L. Richardson have been elected as directors of Decision Data Computer Corp.
- Phil Cleveland and James C. Fosberg have been promoted to vice-presidents of Microdata Corp.
- Peter Weill has joined Incoterm Corp. as vice-president of international marketing and operations.
- John J. Splavak has been named vice-president/U.S. and Canada sales for Informatics, Inc. system products.
- Thomas T. Harding has joined Interdata, Inc. as vice-president of marketing and sales. He succeeds John W. Schneider, who was named product planning coordinator.
- Phillip R. Peterson has become vice-president of finance, Joseph F. Guzman, vice-president of marketing and sales management and John D. Kerin national marketing manager of major accounts for the Jay Corp.
- David L. Britton has been appointed manager of OEM marketing for the Memorex Corp. equipment products group OEM division.
- Howard W. Autry has been appointed vice-president of quality assurance of Precision Monolithics, Inc.
- Donald R. Stackhouse has been elected vice-president of switched services operations for RCA Global Communications, Inc.
- Paul C. Ely Jr. was elected a vice-president of Hewlett-Packard Co.
- Robert D. Greer has been electad vice president-finance of Data Devices International, Inc.
- John N. Shevello has been appointed director of Small Computer Systems on the Burroughs Corp. Corporate Product Management staff.
- E.L. Rognlie has been named vice-president of marketing for Warrex Computer Corp.
- Wesley D. Thrash has been appointed vice-president/customer services for Mohawk Data Sciences Corp.
- William C. Campbell has been named to the newly created position of vice-president/operations at Computer Management Services.
- L. Paul Harnois was elected vice-president-controller of CTE Information Systems, Inc., a subsidary of General Telephone & Electronics Corp.
- Fred B. Bialek has been appointed vice-president, general manager of the Consumer Products Division of National Semiconductor Corp.
- John E. Wagner has been appointed vice-president of Amherst Systems, Inc.
- Benjamin J. Cohen has been appointed corporate vice-president of Zircon Co.

POSITION ANNOUNCEMENTS

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You may be the person to complement NCR's team of EDP professionals in our Marketing Division in Dayton, Ohio. We are seeking people who have data processing experience in an educational or local government environment, with a background of administration and/or academic applications.

The individuals selected must have good oral and written communication skills. Some marketing and sales experience is preferred, and NCR computer knowledge would be a definite plus.

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NCR

Mr. Emil Ankermiller
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Opportunity for Senior Systems Programmers in our Utilities Department with:

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Immediate openings exist in our Engineering Dept. for individuals who have had engineering project responsibility. Applicants should have an MSEE or BSEE with 3-5 years in-depth digital design experience, and be familiar with TTL, MOS logic, memory systems, mini-/micro-computer interfaces, peripheral specifications and systems debugging.

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An opening exists in our Engineering Department for an analog design engineer with a minimum of 3 years experience in the design and development of A/D and D/A converters, S/H circuitry and high speed data acquisition systems.

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Send resume to: T.O. Butts, Director, Human Resources, Blue Cross and Blua Shield of Alabama, 930 South 20th St., Birmingham, Ala. 35298.
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These positions entail the system desgin and development of software for large communications networks. Experience at all levels in assembly language and telecommunications and a mini-computer background is necessary. A related BS degree is preferred.

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Requires persons skilled in assembly language, telecommunications and with a sound background in mini-computers to perform maintenance and field support of telecommunications networks. A number of these positions provide the opportunity for substantial travel and customer contact.

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You will be responsible for data processing systems development, operations, radio and telephone communications, microfilming, supervising a staff of 30 plus employees and a one million dollar annual budget.

In addition to meeting the minimum employment standards which require an appropriate degree or equivalent and five years of experience of an administrative or technical nature, including data processing applications, two years of which shall have been in a supervisory role, the IDEAL candidate will possess heavy leadership experience in implementing state-of-the-art teleprocessing systems in local government, plus strong systems planning and general management skills. An MBA DEGREE would be desirable, but is not mandatory.

Submit an official San Luis Obispo County application form along with your detailed resume (with recent salary history) to the County Personnel Department, 1015 Monterey Street, San Luis Obispo, California, 93401, no later than November 26, 1976.

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PROGRAMMER/ANALYSTS

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CSC

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Data 100 Net Drops

MINNETONKA, Minn. – Second-quarter and mid-year earnings at Data 100 Corp. were unfavorably impacted by higher than anticipated foreign exchange losses which reached almost $400,000 in the second quarter alone.

Earnings for the quarter ended June 30 dipped to $1.4 million or 35 cents a share from $1.6 million or 39 cents a share in the year-ago quarter.

Revenues for the quarter, however, rose to $17.3 million compared with $12.8 million a year ago.

Six-month earnings also dropped, to $2.4 million or 60 cents a share compared with $3 million or 74 cents a share in the year-ago period.

Revenues rose to $35 million compared with $24.3 million a year ago.

President Edward D. Orenstein noted business continued to improve during the first six months of 1976.

Univac Orders Up 33% in Quarter

Sperry Half-Year Net Increases 4.7%

NEW YORK – Sperry Rand Corp.'s second-quarter earnings rose 4.9% to a record $37.5 million or $1.08 a share compared with $35.8 million or $1.03 a share in the same period last year. Six-month earnings climbed 4.7%.

Commercial orders for Univac computers rose 33% in the second quarter.

Foreign currency adjustments adversely affected results. Excluding the effects of balance sheet currency translations, earnings would have risen 24% over those of a year ago, according to Chairman J. Paul Lyet.

Performance Predicted

"Overall, we remained on target through what we knew would be a difficult first half of our fiscal year. Foreign currency adjustments may continue as a negative factor for the near future, but we continue to expect a strong performance in the second half," he said.

During the second quarter, revenues rose 2.4% to nearly $776.2 million compared with $758.1 million in the year-ago period.

During the six months, earnings rose 4.7% to $72.3 million or $1.90 a share compared with $69.1 million or $1.94 a share in the same period last year.

Revenues for the half year rose to $1.56 million compared with $1.53 million in the year-ago period.

Restated Results

Results in 1975 were restated to reflect a change in accounting for foreign currency translations.

The firm is "confident that demand will continue to increase in the next year," Lyet said.

"Backlog as of Sept. 30, 1976 was $1.85 billion, substantially the same as a year ago, as a decline in defense orders was offset by a gain in commercial bookings," he added.

DEC First-Quarter Earnings Rise As Operating Revenues Climb 46%

MAYNARD, Mass. – Digital Equipment Corp. started off its new fiscal year with a 46% jump in operating revenues and earnings of $16.7 million or $1.29 a share compared with $11.4 million or 95 cents a share in the year-ago first quarter.

Operating revenues totaled $204.5 million compared with $140.5 million in the same period last year.

Strong Orders

"The improvement in first-quarter sales is a result of a consistently strong order pattern that developed in the quarter one year ago," a company spokesman said. "This growth pattern pervades both foreign and domestic markets and has resulted in major growth to Digital's OEM business and substantial activity in other market groups."

DEC's order rate continues to rise, the firm said, and construction of facilities in New Hampshire and the Southwest are on schedule. Employment is expected to increase beyond the current level of 27,000 people, the spokesman added.

While general economic data appears to reflect a more gradual improvement in the U.S. economy than anticipated earlier, DEC is looking forward to a high level of demand in the coming quarters and expects further gains in sales and earnings this fiscal year, he said.

Datapoint Year Revenues Rise

SAN ANTONIO, Texas – Datapoint Corp.'s revenues rose 54% for the year ended July 31 while operating earnings gained 45%.

Year-end results saw earnings climb to $6.4 million or $2.18 a share with a $495,000 tax credit. This compared with year-ago earnings of $4.6 million or $2.11 a share including a $1.5 million tax credit.

Revenues for the year rose to $72.1 million compared with $46.9 million a year ago.

Fourth-quarter earnings climbed to $1.9 million or 57 cents a share compared with $1.5 million or 63 cents a share, including a $498,000 tax credit, in the year-ago period.

Revenues for the quarter soared to $21.4 million compared with $13.7 million in the same period last year.

Harold E. O'Kelley, chief executive officer, predicted continued growth in the range of 30% to 40% in earnings per share.

Memorex Doubles Net in Period

SANTA CLARA, Calif. – Memorex Corp. doubled its earnings in the third quarter and nine months, while revenues rose 26% in each period compared with the year-ago periods.

Most of the 26% rise in revenues came from sales as opposed to services. In the third quarter, revenues rose to $84.3 million compared with nearly $67 million in the year-ago quarter.

Of this, $57.2 million was in sales compared with $41.8 million in the same period last year, while rental and service revenues rose to $27.1 million from $25.2 million.

Earnings for the quarter reached $10.3 million or $1.66 a share including $3.9 million in special credits. In the year-ago quarter, Memorex earned $4.4 million or 75 cents a share, including $1.7 million in special credits.

For the nine months, earnings more than doubled to $28.5 million or $4.55 a share, including $10.8 million in special credits. For the same period last year, the firm earned $12.2 million or $2.04 a share including $7.1 million in special credits.

Revenues for the nine months totaled $244.6 million compared with $194.2 million in the same period last year.

During this period, revenue from sales rose to $165.6 million from $117.5 million in the year-ago period.

Nickels & Dimes

Potter Instrument has reached an agreement in principle with its institutional lenders to settle outstanding term debt of about $18 million for $2.4 million and to issue preferred stock for the balance of the debt on terms to be agreed upon.

$$$

Graham Magnetics had earnings of $151,845 or 16 cents a share on revenues of $3.98 million for the first quarter ended Sept. 30. In the year-ago period, earnings totaled $183,942 or 20 cents a share on revenues of $3.7 million.

$$$

Computer Automation increased its semiannual dividend 20% and declared a 6 cent dividend payable Dec. 20 to holders of record Nov. 8.

$$$

Management Assistance shareholders have approved a one-for-four reverse split of the firm's common stock.

$$$

Electronic Memories & Magnetics declared a 25 cent dividend payable Dec. 10 to holders of record Nov. 26.

$$$

Genesee Computer Center had first-quarter earnings of $14,490 on revenues of $221,898 compared with earnings of $4,889 on revenues of $206,910 a year ago.

$$$

Centronics Data Computer announced a 20 cent dividend payable Jan. 3 to holders of record Nov. 30.

$$$

Anderson Jacobson's first-quarter earnings rose to $262,090 or 11 cents a share compard with $227,215 or 9 cents a share in the year-ago period. Revenues also rose, to $5.2 million compared with $4.4 million in last year's period.

$$$

General Automation reported unaudited results for the fiscal year ended July 31 with pretax earnings essentially break-even for fiscal 1976 compared with a pretax loss of $6.1 million in 1975.

$$$

Computer Installations declared a 5 cent dividend payable Nov. 12 to holders of record Nov. 2.

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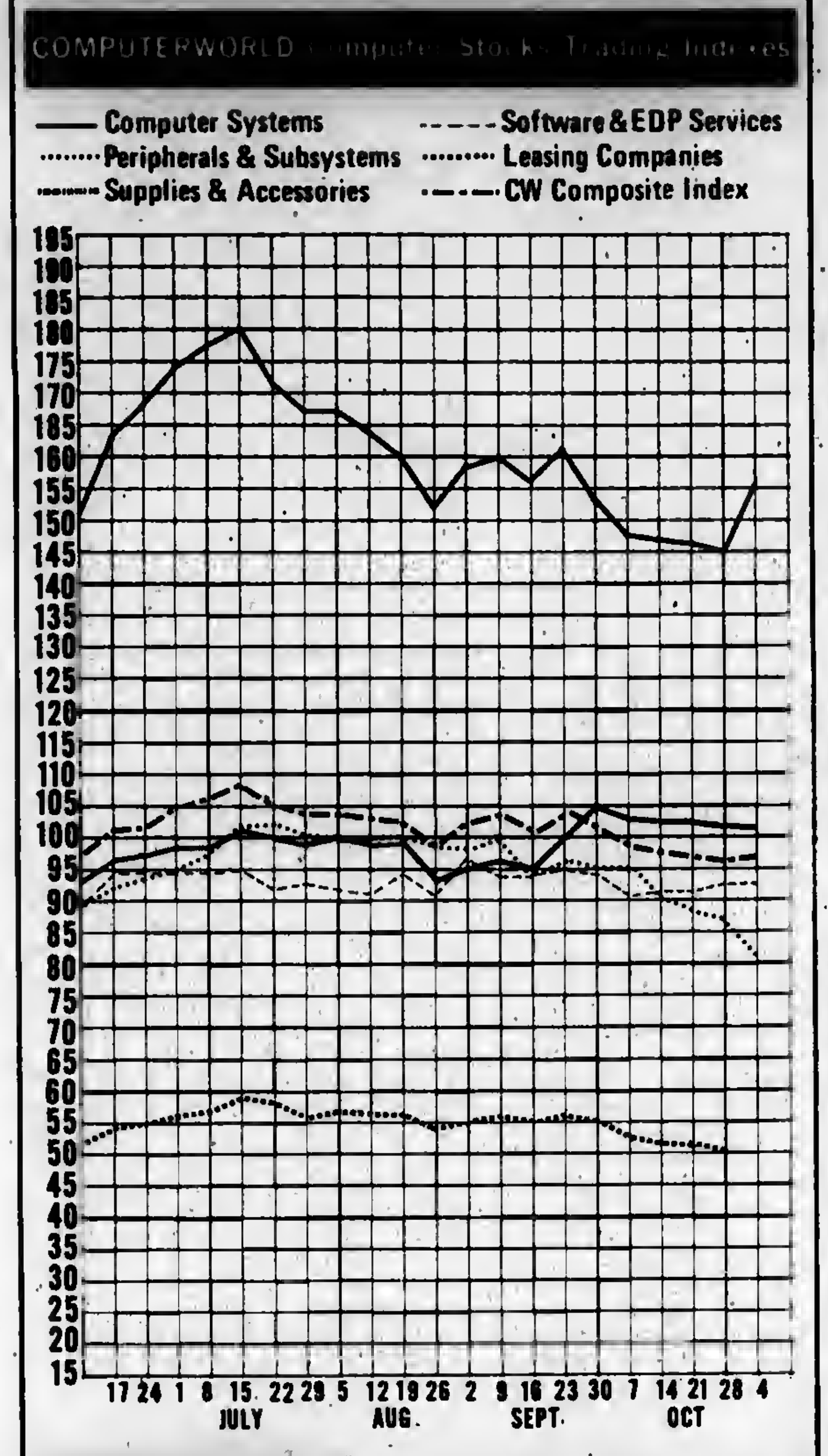

Earnings Reports

AT&T
Year Ended Aug. 31

	1976 (000)	a1975 (000)
Shr Ernd	$5.74	$5.10
Revenue	31,609,974	27,789,337
Earnings	3,589,791	3,096,426
3 Mo Shr	1.60	1.33
Revenue	8,309,203	7,299,688
Earnings	1,012,416	810,248

a-Restated.

AMPEX
Three Months Ended July 31

	1976	1975
Shr Ernd	$.17	$.14
Revenue	65,449,000	63,655,000
Tax Cred	676,000	607,000
Earnings	1,812,000	1,559,000

ANALOG DEVICES
Three Months Ended Aug. 2

	1976	1975
Shr Ernd	$.33	a$.24
Revenue	10,488,000	7,548,000
Earnings	531,000	375,000
9 Mo Shr	.89	a.64
Revenue	28,812,000	22,294,000
Earnings	1,410,000	968,000

a-Adjusted for 5% stock dividend in April 1976.

DATAPOINT
Year Ended July 31

	1976	1975
Shr Ernd	$2.18	$2.11
Revenue	72,050,000	46,890,000
Tax Cred	495,000	1,473,000
Earnings	6,431,000	4,567,000
3 Mo Shr	.57	.63
Revenue	21,440,000	13,690,000
Tax Cred	.....	498,000
Earnings	1,870,000	1,477,000

DOCUMATION
Four Months Ended Aug. 13

	1976	1975
Shr Ernd	$.24	$.19
Revenue	5,447,476	3,700,568
Earnings	634,695	478,170
7 Mo Shr	.39	.29
Revenue	8,732,949	6,237,121
Earnings	1,020,750	736,128

ON-LINE SYSTEMS
Three Months Ended July 31

	1976	1975
Shr Ernd	$.30	$.07
Revenue	3,632,509	2,202,592
Earnings	257,507	59,427

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, NOVEMBER 3, 1976

All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		1976 RANGE (1)	CLOSE NOV 3 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	BUPPOUGHS COPP.	84-108	89 3/8	-2 1/4	-2.4
O	COMPUTER AUTOMATION	10- 19	14 1/R	- 3/8	-4.2
N	CONTROL DATA CORP	18- 27	23 1/2	+ 1/2	+2.1
N	DATA GENEPAL COPP	40- 60	42 3/8	- 1/2	-1.1
O	DATAPOINT CORP	24- 46	26	-1 3/4	-6.3
O	DIGITAL COMP CONTROL	2- 7	3 7/8	+ 3/8	+6.8
N	DIGITAL EQUIPMENT	138-141	149 1/2	-1 1/4	-0.8
N	ELECTRONIC ASSOC.	2- 3	2 1/8	- 1/8	-5.3
A	ELECTRONIC ENGINEEP.	7- 16	7 1/2	-1 1/8	-13.0
N	FOXBOPO	28- 30	42 3/4	+ 1/2	+1.1
O	GENEPAL AUTOMATION	4- 11	4 3/8	+ 1/8	+2.7
O	GRI COMPUTER CORP	1- 1	3/8	- 1/8	-16.6
N	HEWLETT-PACKARD CO	80-117	83 1/2	- 3/8	-0.7
N	HONEYWELL INC	34- 56	43 1/8	- 7/8	-1.9
N	IBM	227-288	268	+2	+0.7
O	MANAGEMENT ASSIST	1- 6	6 1/4	+4 3/8	+284.6
O	MEMOREX	1R- 33	20	-1	-4.7
O	MICPODATA COPP	10- 28	17 1/2	- 1/2	-2.7
O	MODULAR COMPUTEP SYS	4- 14	3 3/4	0	0.0
N	NCP	24- 37	33 7/8	-1 1/4	-3.5
O	PPIME COMPUTEP INC	4- 14	13 1/2	+1	+8.0
N	PEPKIN-ELMEP	19- 27	21	+ 1/2	+2.4
N	PAYTHEON CO	43- 67	60 5/8	-2 5/8	-4.1
N	SPEPRY RAND	40- 52	45 3/8	- 1/2	-1.0
O	SYCOR INC	10- 31	10	-1 1/4	-11.1
A	SYSTEMS ENG. LABS	6- 10	6 3/R	- 3/8	-5.3
N	VAPIAN ASSOCIATES	12- 17	12 3/4	+ 3/8	+3.0
A	WANG LABS.	11- 20	14 1/2	0	0.0

LEASING COMPANIES

EXCH		1976 RANGE (1)	CLOSE NOV 3 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMDISCO INC	3- 10	8 1/2	0	0.0
A	COMMERCE GROUP CORP	2- 3	2	+ 1/8	+6.6
A	COMPUTER INVSTPS GPP	1- 3	1 1/4	- 1/8	-9.0
N	DATRONIC RENTAL	1- 8	1/2	- 3/8	-42.8
A	DCL INC	1- 1	5/8	0	0.0
N	DPF INC	3- 8	6 5/R	- 3/8	-5.3
N	ITEL	6- 13	12 7/8	+ 1/4	+1.9
N	LEASCO CORP	6- 19	18 7/8	+ 7/8	+4.8
O	LEASPAC COPP	0- 1	1/8	0	0.0
O	NPG INC	0- 1	1/8	-	-33.5
A	PIONEER TEX CORP	6- 9	7 1/4	- 1/8	-1.6
N	U.S. LEASING	7- 12	8 5/8	- 3/8	-4.1

SOFTWARE & EDP SERVICES

EXCH		1976 RANGE (1)	CLOSE NOV 3 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 3	1 1/4	- 1/8	-9.0
O	ANACOMP INC	6- 11	7 1/8	0	0.0
A	APPLIED DATA RES.	2- 4	3 7/8	+ 7/8	+29.1
N	AUTOMATIC DATA PPOC	17- 33	27 1/8	- 7/8	-3.1
O	COLEMAN AMEPICAN COS	2- 6	2 3/8	0	0.0
O	COMPUTER DIMENSIONS	3- 7	3 3/4	- 1/8	-2.1
O	COMP ELECTION SYSTMS	5- 9	5 1/4	0	0.0
O	COMPUTEP HOPIZONS	1- 2	1 1/4	0	0.0
O	COMPUTER NETWOPK	2- 6	4 1/8	- 3/8	-8.3
N	COMPUTER SCIENCES	4- 8	5 5/8	- 1/4	-4.2
O	COMPUTER TASK GROUP	1- 2	1 1/4	- 1/4	-16.6
O	COMPUTER USAGE	3- 6	2 3/4	- 1/8	-4.3
O	COMSHARE	2- 9	4 3/4	0	0.0
O	DATA DIMENSIONS INC	2- 4	2 3/4	0	0.0
O	DATATAB	1- 2	1 1/2	+ 1/8	+9.0
N	ELECTPONIC DATA SYS.	12- 18	13	0	0.0
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	INSYTE COPP	1- 3	1 3/8	0	0.0
O	IPS COMPUTEP MARKET.	1- 2	1 3/8	0	0.0
O	KEANE ASSOCIATES	2- 4	3	+ 1/2	+20.0
O	KEYDATA COPP	2- 3	1 5/8	- 1/8	-7.1
O	LOGICON	3- 5	4 1/2	+ 1/2	+12.5
A	MANAGEMENT DATA	1- 3	2	0	0.0
A	NATIONAL CSS INC	13- 23	18 3/8	-1	-5.1
A	ON LINE SYSTEMS INC	17- 22	17	0	0.0
N	PLANNING RESEAPCH	3- 5	3 1/4	- 3/8	-10.3
O	PPOGPAMMING & SYS	1- 1	3/8	0	0.0
O	PAPIDATA INC	2- 3	1 7/R	+ 1/8	+7.1
O	PEYNOLDS & PEYNOLD	13- 21	16	+ 1/2	+3.2
O	SCIENTIFIC COMPUTERS	1- 1	7/8	0	0.0
O	TYMSHARE INC	13- 28	15	- 1/2	-3.2
A	UPS SYSTEMS	3- 3	4	- 1/8	-2.0
N	WYLY CORP	2- 7	1 3/4	+ 1/8	+7.6

PERIPHERALS & SUBSYSTEMS

EXCH		1976 RANGE (1)	CLOSE NOV 3 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	8- 13	10	0	0.0
O	ADVANCED MEMORY SYS	4- 10	6 1/2	+ 1/8	+1.9
N	AMPEX CORP	3- 10	6 3/4	0	0.0
O	ANDEPSON JACOBSON	2- 4	3	- 1/4	-7.6
O	APPLIED DIG DATA SYS	13- 23	19 1/4	+ 3/4	+4.0
O	BEEHIVE MEDICAL ELEC	3- 9	8 3/8	+ 1/8	+1.5
A	BOLT,BEPANEK & NEW	7- 11	8 3/8	+ 1/8	+1.5
N	BUNKER-RAMO	3- 10	7 1/4	+ 1/4	+3.5
A	CALCOMP	4- 7	4 1/8	0	0.0
O	CAMBRIDGE MEMOPIES	0- 6	3/8	+	+11.0
N	CENTRONICS DATA COMP	20- 36	23 1/2	- 5/8	-2.3
O	CODEX CORP	22- 42	27	-1	-3.5
O	COGNITRONICS	1- 1	5/8	- 1/8	-16.6
O	COMPUTER COMMUN.	1- 6	4 3/4	- 1/8	-2.5
O	COMPUTEP CONSOLES	4- 7	3 1/2	- 1/4	-6.6
A	COMPUTEP EQUIPMENT	1- 3	1 1/2	- 1/4	-14.2
O	COMPUTER TPANSCEIVER	1- 3	3/4	0	0.0
O	CONTEN	4- 9	7 3/8	+ 3/8	+5.1
N	CONRAC CORP	20- 25	22 1/4	+ 3/8	+1.7
O	DATA ACCESS SYSTEMS	1- 3	4 3/4	+ 1/4	+5.3
O	DATA 100	7- 13	7 7/8	- 1/4	-3.0
A	DATA PPODUCTS COPP	3- 13	11	+ 3/8	+3.3
O	DATA TECHNOLOGY	1- 2	1 3/8	0	0.0
O	DATUM INC	1- 2	1/2	0	0.0
O	DECISION DATA COMPUT	1- 4	1 3/8	0	0.0
O	DELTA DATA SYSTEMS	1- 1	3/8	+ 1/8	+23.0
N	ELECTRONIC M & M	1- 4	2 7/8	0	0.0
O	FABPI-TEK	1- 1	7/8	0	0.0
O	GENERAL COMPUTEP SYS	0- 2	3/8	0	0.0
N	HAZELTINE CORP	4- 12	8 3/8	- 1/8	-1.4
N	HAPRIS CORP	34- 53	50 1/4	- 1/8	-0.2
A	INCOTERM COPP	9- 20	11 1/2	- 3/4	-6.1
O	INFOREX INC	3- 7	4 1/4	- 1/8	-2.8
O	INFORMATION INTL INC	10- 18	12	0	0.0
O	INTEL CORP	50-109	30	-4 1/2	-8.2
A	LUNDY ELECTRONICS	3- 7	3 1/2	- 1/8	-3.4
O	MSI DATA COPP	3- 7	6 5/8	+ 3/4	+12.7
A	MILGO ELECTRONICS	15- 21	18 1/4	+ 1/8	+0.6
N	MOHAWK DATA SCI	3- 10	5 3/4	0	0.0
O	PENRIL COPP	1- 3	1 7/8	0	0.0
A	PEPTEC CORP	3- 8	6 1/8	+ 1/2	+8.6
A	POTTER INSTPUMENT	2- 2	1 3/4	0	0.0
O	PPECISION INST.	3- 10	2	0	0.0
O	QUANTOR CORP	4- 6	3 3/4	0	0.0
O	PECOGNITION EQUIP	6- 11	8	- 1/4	-3.0
N	SANDEPS ASSOCIATES	6- 11	7 7/8	+ 1/8	+1.6
O	SCAN DATA	1- 4	1 3/8	+ 1/8	+10.0
O	STOPAGE TECHNOLOGY	9- 13	9 7/8	+ 1/8	+1.2
O	T BAR INC	5- 10	5 3/R	+ 1/8	+2.2
O	TALLY CORP.	4- 6	3 7/8	0	0.0
O	TEC INC	3- 7	6 1/2	+ 1/4	+4.0
N	TEKTRONIX INC	45- 69	39 1/2	-1 1/4	-2.0
N	TELEX	2- 5	2 3/8	+ 1/8	+5.0
O	WANGCO INC	11- 22	21 1/8	0	0.0
O	WILTEK INC	2- 2	1 3/8	- 3/8	-21.4

SUPPLIES & ACCESSORIES

EXCH		1976 RANGE (1)	CLOSE NOV 3 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED SYSTEMS INC	1- 4	3 3/8	0	0.0
O	BALTIMORE BUS FORMS	3- 3	3 3/8	0	0.0
A	BARRY WPIGHT	6- 10	8 5/8	- 1/8	-1.4
O	CYBERMATICS INC	0- 1	1/2	0	0.0
A	DATA DOCUMENTS	25- 45	45 1/4	0	0.0
O	DUPLEX PPODUCTS INC	13- 24	13	- 1/4	-1.8
N	ENNIS BUS. FORMS	6- 8	5 1/2	0	0.0
O	GRAHAM MAGNETICS	8- 13	9 1/4	- 1/4	-2.6
O	GRAPHIC CONTPOLS	13- 19	16	- 1/4	-1.5
N	3M COMPANY	33- 66	59 3/8	- 7/8	-1.4
O	MOORE CORP LTD	32- 31	34 3/4	+1 3/4	+5.3
N	NASHUA CORP	11- 18	16 1/2	- 5/8	-3.6
O	STANDAPD REGISTEP	15- 19	17 1/4	0	0.0
O	TAB PRODUCTS CO	5- 11	8 3/4	0	0.0
N	UARCO	19- 23	19 1/2	+ 1/4	+1.2
A	WABASH MAGNETICS	4- 9	8 3/4	0	0.0
N	WALLACE BUS FORMS	19- 23	21 3/4	0	0.0

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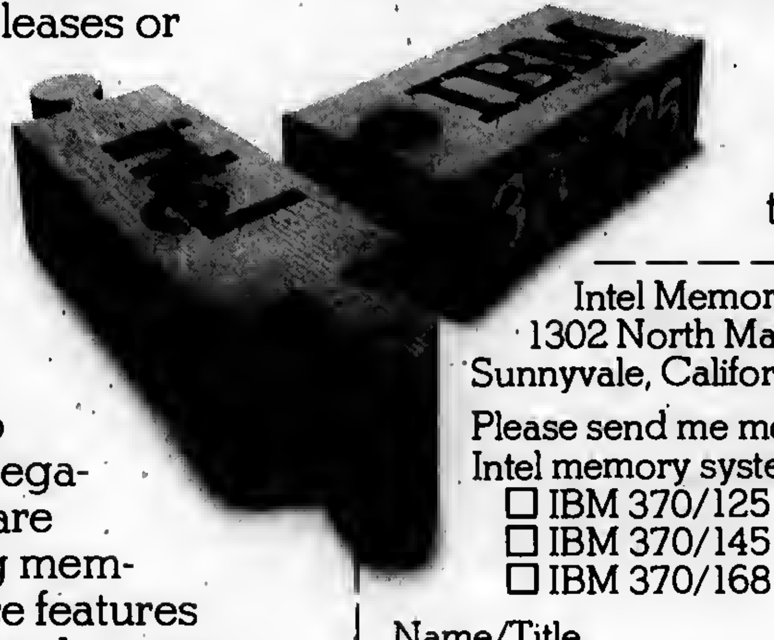

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Mainframers Expand User Options

•Burroughs Has B1800 Systems

By Esther Surden
Of the CW Staff

DETROIT – Designed for small- and medium-scale users, the Burroughs Corp. B1800 series introduced last week provides 40 times the throughput in half the space of the B1700 systems it replaces, according to a vendor spokesman.

The systems are comparable to the IBM 3/12 on the low end and to the IBM 370/115-2 on the high end, he added.

Three models of the 1800 series were announced:

- The B1830 features a processor oper-

(Continued on Page 7)

•Univac Adds 1100/80 Family

By Esther Surden
Of the CW Staff

NEW YORK – Univac unveiled last week two large-scale systems said to be in the performance range of the IBM 370/168-3.

The 1100/80 series introduced includes the 1100/81 single-processor system and the 1100/82 dual-processor unit. The series has "two times the performance" of the firm's earlier 1100/40 series, according to a spokesman.

The systems, which will be available in the first quarter of 1977, will range in

(Continued on Page 7)

•IBM Extends SNA Functions For Distributed Processing

By Ronald A. Frank
Of the CW Staff

WHITE PLAINS, N.Y. – IBM has extended the distributed processing functions of its Systems Network Architecture (SNA) by enhancing the ability of its 3705 front ends to perform multiple processor network control operations.

The SNA upgrades are software-oriented and include an Advanced Communications Function (ACF) capability that operates on the earlier Virtual Telecommunications Access Method (Vtam), Telecommunications Access Method (Tcam) and Network Control Program/Virtual Storage (NCP/VS).

The ACF versions of Vtam, Tcam and NCP/VS together with the Multisystem Networking Facility (MNF) make it possible for terminal users connected to one 3705/370 configuration to access programs residing in other 3705/370 configurations. With the extended SNA capabilities, more network control functions for handling data traffic reside in the 3705 front end, IBM explained.

Multiple 370s can be linked via 3705 front ends which transmit data to each other in full-duplex mode using IBM's Synchronous Data Link Control (SDLC) at speeds up to 56 kbit/sec. Traffic flow in the network can operate in a distributed pattern between the 3705s operating under ACF/NCP/VS, thereby freeing the network's mainframes "to perform more work on more applications for more users," IBM said.

The MNF allows the distribution of applications and data bases across several 370 systems in different locations for security or backup; if one network mainframe is not operational, network traffic with other hosts can continue under control of the 3705s.

The MNF allows data to be routed automatically, avoiding line switching under manual control from a CPU console

(Continued on Page 5)

And Boundary Getting Fuzzier

No DP-Communications Line, FCC Told

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. – No logical technical boundary can be drawn between computing and communications, experts in the area resulting from the marriage of these fields told the Federal Communications Commission (FCC) at a planning conference here last week.

Arranged by the American Federation of Information Processing Societies (Afips), the conference concluded that distinctions which now exist between computing and communications will only blur as time goes on, thus further complicating the FCC's regulatory job.

The commission is charged with regulating communications services, but not with monitoring them, according to FCC Chairman Richard Wiley.

The panel of technical experts, led by Vinton G. Cerf (who recently left a teaching position in electrical engineering at Stanford University to work with the Information Processing Techniques Office of the Defense Advanced Research Agency), agreed, however, that a regulatory climate is needed "which will encourage innovation, ensure a reliable interconnection of primary services and promote the acquisition of capital for growth."

Coverage of the FCC Planning Conference continues on Page 8.

In addition, the panel of four concurred that "packet switching as a technology is having an important effect on computer communications and will profoundly affect frequency allocation."

Finally, the panelists asked the FCC to recognize that high local access costs, international link costs and user learning costs are limiting the growth of computer communications services.

(Continued on Page 2)

Terminal Debuts, Enhancements Accent Info '76

By Ronald A. Frank
Of the CW Staff

CHICAGO – Data terminal innovations and enhancements were stressed at the Info '76 conference here last week.

Informer, Inc. of Los Angeles introduced a terminal-oriented bank system that allows tellers to display customer signatures on a standard CRT screen. Signatures can be stored in digitized form in a CPU and called up for verification in on-line mode over private lines at 2,400 bit/sec, the vendor said.

Signatures can be entered into a CPU from checks or any other conventional document and multiple signatures can be displayed on a single CRT screen, a spokesman added. Up to three keyboard display terminals can be clustered on a microprocessor controller.

Attendees at Info '76 heard more than 200 speakers in over 80 technical sessions covering 11 specialized topics.

The exhibition included 137 companies and show registration was estimated at 11,300.

The 1977 Info conference will be held Oct. 17-20 in New York. Additional coverage of this year's conference begins on Page 9. Photo feature on Page 2.

The signatures are displayed in a matrix of 192 by 64 points with handwriting displayed "slightly larger than lifesize," according to the spokesman.

A system including a signature capture unit, one keyboard display terminal and the controller costs $7,500; individual terminals cost $2,450 each. An upgrade for operation at 9,600 bit/sec will be introduced after the first of the year, the spokesman said.

As expected, AT&T demonstrated its 43 Teleprinter which operates at 10- or 30 char./sec over dial-up lines using the plug and jack arrangement approved by the Federal Communications Commission [CW, Nov. 8].

The portable terminal uses an upper- and lower-case character set. A magnetic drive print head generates 9 by 7 dot matrix characters on 12-in. wide paper.

Utilizing 132 column/line printing, the fanfold paper is available from one forms supplier, but others are expected to supply the paper later, an AT&T spokesman noted.

First tariffs for the 43 Teleprinter will be

(Continued on Page 6).

CW Photo by A. Dooley

Bob Tabernacki tries out the AT&T 43 Teleprinter on a visit to the Info '76 exhibit hall last week.

Calcomp vs. IBM Start Delayed; Judge Admits Comstat Data

By Molly Upton
Of the CW Staff

LOS ANGELES – IBM attorneys fought California Computer Products Corp., Inc.'s (Calcomp) request for a jury trial both before and after jury selection here last week in the Calcomp vs. IBM antitrust trial.

Originally scheduled to begin last Wednesday, the trial should start today or tomorrow in federal district court.

Even before the trial began, there were signs this trial would be different in many ways from the 18-month-old U.S. vs. IBM antitrust trial in New York.

IBM's lead attorney, David Boies, indicated he intends to call a number of top IBM executives as his witnesses in the case. By contrast, IBM executives answered government subpoenas and appeared in court in New York, but did not take the stand [CW, Oct. 25].

In protesting the trial by jury, Boies asked Judge Ray McNichols to strike having a jury or, alternatively, to strike the particular jury panel selected last Tuesday for the case.

The jury does not satisfy a constitutional requirement for cross-representation, Boies told the court, adding all jurors appear to be of one economic classification.

With estimates for the trial's duration

(Continued on Page 5)

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Info Sights

CW Photo Feature
By Ann Dooley

Info '76 attendees watch demonstration of IBM Word Processor/32.

Under the Datapoint Arches

'Cummins and See Us Some Time'

Attendees try out throwing arm at Atlantic Software booth.

Nixdorf's Ray Stimson demonstrates the Model 8870 teletypewriter for Don Rubovits and L. Patrick McClure.

Experts See No Line Between DP, Communications

(Continued from Page 1)

Joining Cerf on the panel were Lynn Hopewell, chairman of the IEEE Computer Society Committee on Computer Communications and senior member of the executive staff of Computer Sciences Corp.; Alex Curran, past chairman of the International Federation for Information Processing's Technical Committee on Computer Communications and president of BNR, Inc.; and Donald Dunn, professor of engineering/economic systems at Stanford University.

Cerf chaired the ad hoc Afips committee composed of these men. Selected to participate in this planning conference on the basis of their technical abilities, they provided the FCC with its first formal examination of the relationship between computer and communication technologies since the commission's first "Computer Inquiry" in 1971.

For Afips, the planning conference represented the kind of contribution this federation of 15 constituent societies hopes to make in the federal policy-making process through its 18-month-old Washington, D.C., office, according to Executive Director Robert W. Rector.

Under the direction of Philip S. Nyborg, the Afips Washington office is intended to carry out the federation's goal "to provide objective information to assist policymakers in reaching technically sound results," Rector said.

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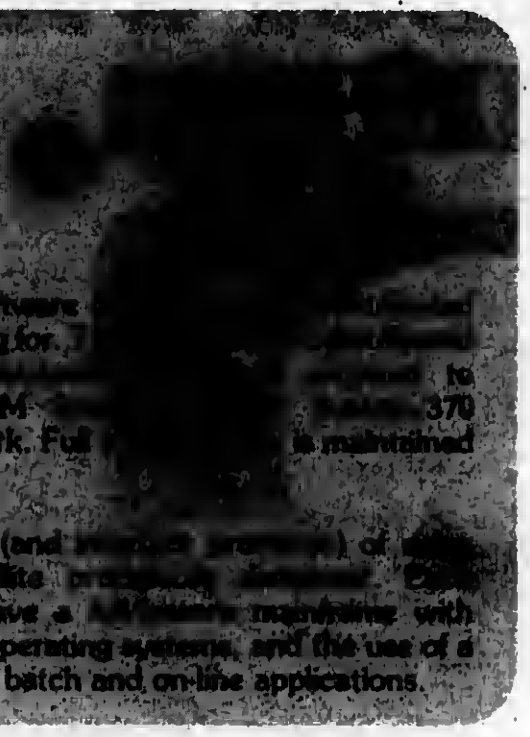
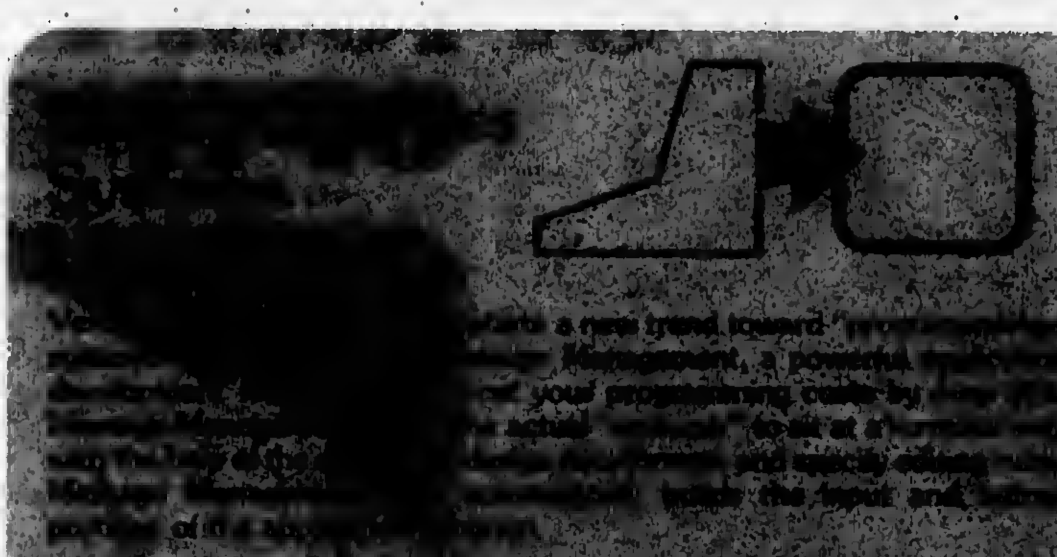


TASK/MASTER - Version II is the software [illegible] processing the industry has been waiting for. [illegible] processing features provide the [illegible] to interconnect any combination of IBM [illegible] 370 processors to form a distributed network. Full [illegible] is maintained with IBM's SNA and SDLC protocol.

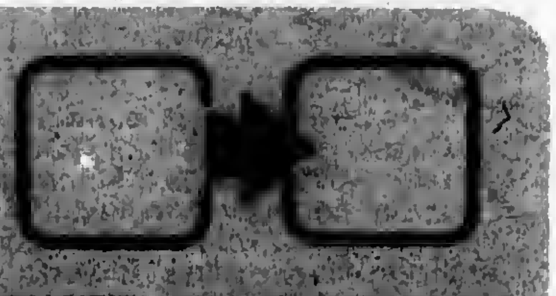
With TASK/MASTER, the limitations (and [illegible]) of [illegible] minicomputer-based systems as satellite [illegible]. [illegible] location in your network can now have a [illegible] mainframe with standard peripheral devices, standard operating systems, and the use of a wide range of proven software for both batch and on-line applications.



[illegible] a new trend toward [illegible] Management, a powerful [illegible] your programming costs by [illegible] actual [illegible] at a [illegible] and [illegible] the input and [illegible] of [illegible]

Another example is TASK/MASTER's Data Entry Feature, a complete on-line data entry system that requires no [illegible]. Data Entry has facilities which are simply not [illegible] systems, including 100% data editing through on-line access to your [illegible]

CICS To TASK/MASTER



CICS users can now become TASK/MASTER users with a minimum of effort. The CICS-to-TASK/MASTER Feature of Version II converts source programs written for CICS to source programs which will operate with TASK/MASTER. Conversion is simple, accurate, fast, and effective. A minimum of 90% of the CICS-related source statements in a program will be automatically converted to their TASK/MASTER equivalents. For many applications the conversion rate will be 100%.

Conversion from CICS is a one-time batch process. [illegible] converted it runs as, and can be maintained [illegible] program. New code to take advantage of the [illegible] available with CICS can be added at any time.

Standard Interfaces

TASK/MASTER is the only communications monitor that has developed a standard interface to any database system, including those that are "home-grown". TASK/MASTER also provides multi-tasking support even when not supported by the database system itself. No programmer retraining is required to go from batch to on-line use.

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IBM Extends SNA Distributed Processing Functions

(Continued from Page 1)

or by user-written operator procedures, IBM said.

For large central site configurations, the 3705-II can now be shared by up to four 370 mainframes in the same location while the 3705-I can be shared by two 370s. This provides terminal users at the same site with access to applications in multiple hosts in a local mode network, according to the vendor.

The ACF/Vtam system can be enhanced with a Network Operating Support Program (Nosp) which supplies extended network management by routing commands to a specific system in the network and returning the responses to the originating terminals, IBM said. The Nosp also allows a 3270 CRT to control network functions instead of the CPU console.

The ACF functions can operate with 370s running under DOS/VS, OS/VS1 or OS/VS2 SVS or MVS. A 3705 with ACF/NCP/VS can be shared by ACF/Vtam and ACF/Tcam program products as well as by the latest current level of the basic Vtam and Tcam system control programming, IBM said.

An ACF upgrade requires the basic Vtam and Tcam versions which are referred to as the systems control programs plus the ACF versions of the access methods. The basic versions are available at no cost while the ACF versions and their associated program products are available under a monthly license fee.

In order to implement ACF/NCP/VS on a 3705, a System Support Program (SSP) is used to generate the NCP version in a host 370. It is then loaded from the mainframe into the 3705 front end.

JES2 Enhancement

IBM also introduced a Network Job Entry (NJE) facility for the Job Entry Subsystem 2 (JES2) which operates under OS/VS2 MVS. The NJE allows a user to define a network consisting of multiple CPUs connected at a single site or via a network using multileaving protocols between separate locations, IBM said.

Jobs can be entered through any supported 370 in the net, directing the work to the mainframe that has access to the data sets and application programs needed to run the job. NJE also allows the user to utilize SNA concepts for CPU-to-CPU batch transmissions, IBM said.

All the SNA programs and licensed program products are available for a monthly fee, and each implementation in a host requires a separate monthly charge.

Monthly license fees apply as follows according to operating system:

PROGRAM PRODUCT	DOS/VS	OS/VS1 & 2
ACF/Vtam	$125	$200
Multisystem Networking Facility	$325	$600
ACF/Tcam		$200
Multisystem Networking Facility		$800

The monthly license fee is $100 for ACF/NCP/VS, $50 for SSP for ACF/NCP/VS and $125 for Nosp. These three program products operate with DOS/VS and OS/VS1 and 2, IBM said.

First customer shipments of the program products will range from the fourth quarter of 1977 to the second quarter of 1978, depending on the particular operating system.

Start Rescheduled For Calcomp vs. IBM

(Continued from Page 1)

ranging from four to six months, Boies said he recognized the inherent economic selection process in effect since McNichols seemed to "automatically" excuse those persons seeking dismissal whose salaries were substantially more than the $20/day paid to jurors.

As an alternative, Boies suggested the possibility of drawing another jury that would sit for a limited number of days each week. This, he suggested, might allow a wider mix of people from different economic strata.

McNichols declared the jury represents valid cross-section, observing they had been drawn from a pool of about 70 people. One hundred fifty names were drawn for the pool and McNichols dismissed all 80 who requested not to serve.

Of the 12 jurors selected, five were men. The jurors' occupations include quality control inspector, homemaker, recent college graduate seeking a teaching position, window cleaner supervisor, airlines clerk and carpenter.

One juror works in the mail order department of a firm and another handles distribution for a gas company. Two are unemployed. Four have previously served as jurors on criminal cases.

'Housekeeping Matters'

The postponement of the trial's opening was designed to allow attorneys to tend to some "housekeeping matters," according to Boies, who is with Cravath, Swaine and Moore, the same firm handling IBM's defense in the New York case. Jack E. Brown of Brown and Bain in Phoenix, which was called in by IBM in the latter stages of its case against Catamore Enterprises, Inc., is also on the IBM legal team here.

Among the "housekeeping matters" discussed Wednesday was whether IBM's Competitive Statistics (Comstat) prepared by its Commercial Analysis Department should be entered as evidence.

After listening to Boies and Maxwell M. Blecher of Blecher, Collins and Hoecker, Calcomp's lead attorney, debate the point for over two hours, McNichols ruled that the Comstat data should be introduced to the jury as Blecher had requested.

Boies reiterated the argument heard in New York that the Comstat data was inaccurate and acknowledged to be so by IBM personnel. Since there was more accurate data on market share in the industry available from censuses 1 and 2 prepared for use in the Greyhound and U.S. cases, there was no reason to confuse the jury, he said.

Boies admitted to McNichols the census data shows IBM has a smaller market share.

Blecher emphasized the censuses would not give IBM's perception of the DP marketplace or how it divided the market into categories. Also, he pointed out, the first census did not begin until 1971.

Toward the end of the debate, Blecher said if the Comstat data was not admitted, the judge might as well throw the case out.

In ruling Comstat admissible as business records, McNichols said there may be continuing objections on Comstat.

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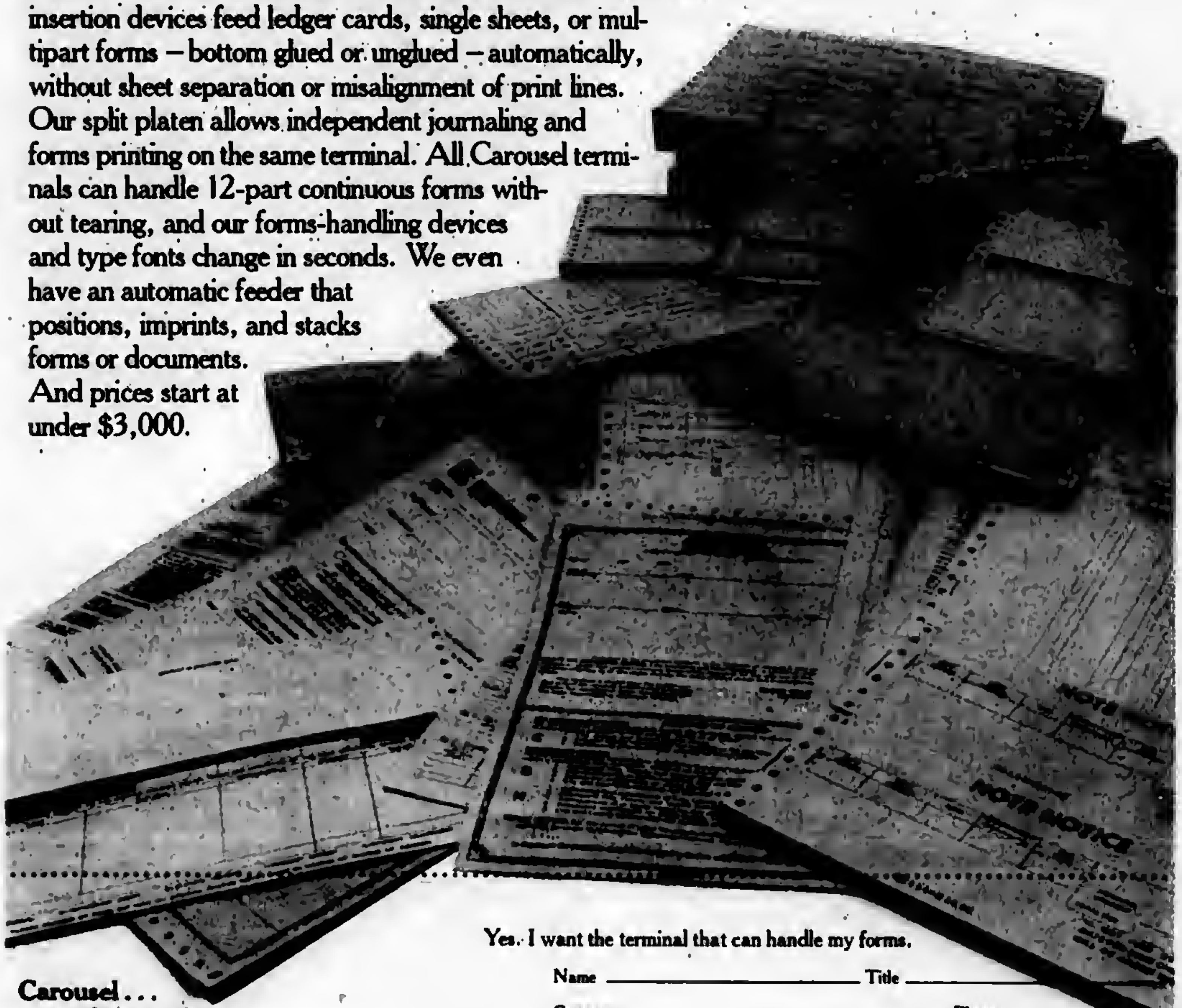

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Info '76 Accent on Terminal Debuts, Enhancements

(Continued from Page 1)

filed by Southern Bell, Michigan Bell, Pacific Telephone and Telegraph and Pacific Northwest Bell, the spokesman said, adding the tariffs will be filed "in December and January."

Only interstate tariffs are planned at present with a two-tier pricing scheme offered on one-, two- and three-year leases. Under this plan, front-end payments will cost "above $100/mo with a later reduction to about $25 to $30/mo. Straight monthly lease rates will be $85 to $100/mo depending on individual tariffs," AT&T said.

The 43 Teleprinter includes a built-in buffer for operation at a top speed of 47.6 char./sec to keep up with a true 300 bit/sec data rate, the AT&T spokesman explained. OEM versions of the 43 Teleprinter without the built-in modem will cost about $970 with an RS-232 interface, a spokesman for Teletype Corp. said.

AT&T also introduced its first two-wire, full-duplex 1,200 bit/sec modem called the 212A.

The data set operates at speeds up to 300 bit/sec or 1,200 bit/sec. In the answer mode, the unit recognizes the incoming signal and automatically selects the correct transmission speed, the AT&T spokesman said.

The 212A, also known as the Dataphone 300/1200, is compatible with Bell 100-type data sets, he added.

In the low-speed range, the 212A operates asynchronously; it operates in either synchronous or character-oriented asynchronous mode at 1,200 bit/sec.

There are no plans to file interstate tariffs for the 212A, the Bell spokesman noted. The data set will cost about $40/mo and a two-tier pricing plan will be announced later.

First tariffs will be filed by Southern Bell and Pacific Northwest Bell after January and the data set will be available from most Bell companies by the first quarter of 1977, he added.

Another Info '76 introduction from AT&T was the 103J data set, described as an upgrade for the 103A originate/answer modem.

Called the Dataphone 300, the unit is compatible with the earlier 103 models and all 113-type data sets. It operates with the low-speed mode of the Model 212A at 300 bit/sec, AT&T said.

The 103J will cost about $25 to $30/mo, the spokesman estimated. It is a smaller LSI unit with improved diagnostics over the 103A, he said.

AT&T will replace its answer-only 113B with a 113D and the originate-only 113A will be replaced with a 113C next year, the spokesman said.

Delta Data Workstation

Delta Data Systems Corp. of Cornwells Heights, Pa., showed its 4700 workstation which includes an intelligent CRT with floppy disk storage.

The system includes programmable emulation features compatible with Honeywell, Burroughs and Univac CPUs, a spokesman claimed.

An IBM emulation version will be introduced in January, he added. The system costs about $7,000, depending on features.

Delta Data also introduced a light pen priced at $900 which can be used on most of the company's CRT terminals. In addition, the firm showed a microprogrammable display terminal compatible with Univac, Burroughs and Honeywell CPUs priced at $130/mo on a one-year lease with maintenance or $2,400 purchase.

MSI Data Corp. displayed its Source 2200 data entry terminal with optical wand scanner that can read MSI bar code and the Codabar marking system from Monarch Marking Systems, Inc.

The portable terminal, which operates from battery power and was designed for retail store environments, is priced at $1,875 to $3,200.

The OCR Division of Key Tronic Corp. of Spokane, Wash., showed its M9 system designed to operate with the firm's data readers and OCR wand. The multiple-font recognition system handles 200 alphanumeric char./sec and costs $10,000 to $25,000, depending on options.

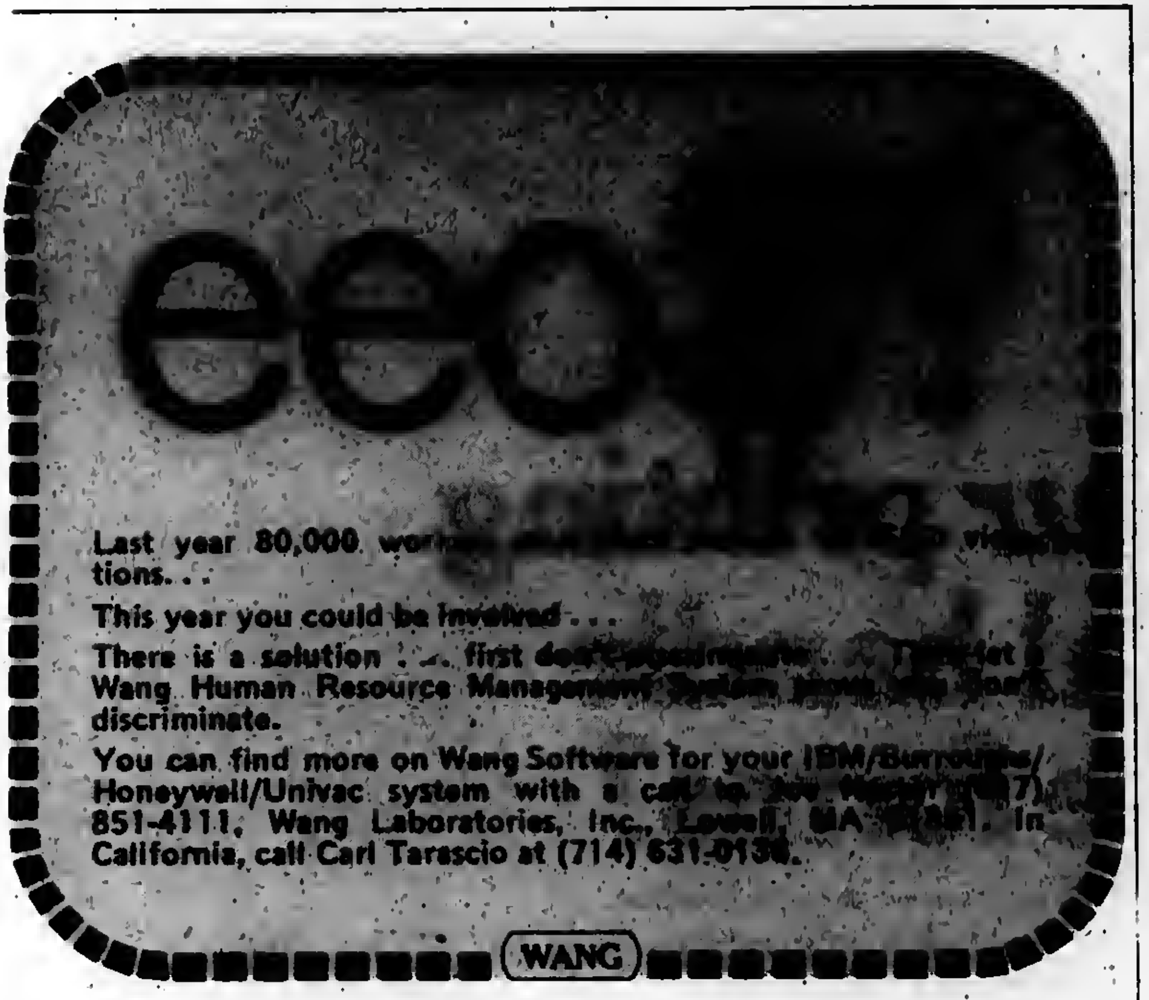
Cummins-Allison Corp. of Glenview, Ill., introduced its 5400 Keyscan key-to-disk data entry system that includes a 480 nsec processor with a disk storage subsystem.

A typical system with a 64K CPU, 9.8M-byte disk storage, 10 keystations, a 600 line/min printer and a tape drive costs $2,339/mo plus $536/mo for maintenance, the firm said.

Decision Data Computer Corp. of Horsham, Pa., introduced a series of printers and card readers designed to operate with IBM mainframes. Five printers, ranging in speed from 300- to 1,500 line/min, were introduced.

Called the 6600 series, the units cost $21,750 to $45,750, depending on features.

The card units handle 80- and 96-column cards and range in price from $9,000 to $14,000, Decision Data said.



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Univac 1100/80 Matches IBM 370/168-3 Performance

(Continued from Page 1)

price from about $2 million to $6 million or $50,000- to $100,000/mo on various lease plans, the firm said.

Current Univac 1100 users can upgrade to the 1100/80 without replacing peripherals or converting programs, the spokesman claimed.

The CPU is used "only to execute programs," the firm noted. It features a 50 nsec cycle time.

Memory for the systems in the 1100/80 series includes both a backing store and cache buffer. The basic backing store includes 512K 36-bit words of semiconductor memory expandable in 256K increments to 4M words and it features parity and error-correction code bits.

In addition, all programs and data are loaded into a 125 nsec 8K buffer for execution. Eight words at a time are fetched from the backing store into the buffer, the firm explained.

The cache is expandable to 16K words; backing store access time to the buffer is 1.25 µsec, the spokesman added.

An Input Output Unit (IOU) controls the transfer of data between the peripherals and main storage. The unit includes a control section and a channel section containing two to four I/O channel modules.

The basic module includes one byte-multiplexer channel and one block-multiplexer channel. The remaining modules may be either byte, block or word channels, Univac said.

Up to four additional channel units can be added to the IOU and a second IOU can also be added to the system, the firm added.

The byte I/O feature, a feature not previously available on Univac systems, transfers one byte at a time and interleaves bytes from each unit record device. The transfer rate is 200 kbyte/sec. Block transfers take place at 1.5M byte/sec.

The CPU and IOU operate on a single buffer, the firm noted; by means of multiple paths to memory, the buffer can handle the request rate of a multiprocessor configuration. The CPU is timed to run instruction overlap with the buffer memory, the firm said.

The Transition Unit connects all the system's central components and receives a periodic pulse which, if interrupted, can initiate an automatic rebootstrap of the system, the firm noted.

The system can also "automatically initiate an alternate configuration" to divide the system into two or more electronically separate systems.

A separate processor provides for diagnostic checkout and fault isolation of the CPU and IOU. Internal registers and logic nodes can be displayed on a Uniscope 200 CRT.

A minimum 1100/80 configuration with 524K words of backing store; an 8K word buffer; I/O channel expansion, word channel features and block multiplexer expansion; dual-access disk storage of eight 8434 spindles and two control units; a dual-access 6,250 bit/in. tape system with six drives and two control units; a 1,400 line/min printer; one 1,000 card/min card reader; and a 250 card/min punch costs $51,451/mo on a five-year contract or about $2 million.

Burroughs B1800 Smaller Than B1700

(Continued from Page 1)

ating at 5M cycle/sec. Memory is expandable from a minimum 48K bytes to a maximum 256K bytes.

- The B1860 with 64K to 384K of memory operates at 6M cycle/sec. It features a 4K bipolar microinstruction cache memory with an 83 nsec/byte read cycle time.
- The B1870, which also has the microinstruction cache memory and a 6M cycle/sec processor time, can store up to 512K bytes of disk storage.

The B1800s are object code-compatible with B1700 systems and programs written for a B1700 can be run on a B1800 without modification, Burroughs said.

Compatibility with the B80 small business system is maintained through the B80 Computer Management System software. While B80 object code programs can be run on the B1800 without change, users who want to optimize use of the B1800 will have to recompile programs, the spokesman noted.

The B1800 systems are said to be suited to both batch and on-line transaction-oriented applications and can serve as stand-alone systems or units in a decentralized network.

Memory for the system is 4K MOS chips. Read cycle time is 400 nsec/byte for the 1830 and 333 nsec/byte for the 1860 and 1870.

Microinstruction cache memory replaces the control memory on the B1700. Its function under hardware management is to ensure the most used microcode is in the cache for use by the system, the spokesman explained, noting the cache on the 1800 does not store data.

On the B1870, 5.9M bytes of auxiliary disk storage is used as part of the system's memory. A head-per-track disk with a 5 msec average access time, it is used as a virtual memory for the operating system.

CPU size reduction has been achieved through the use of Burroughs Current Mode Logic in the 1830 and the CTL III complementary transistor logic in the B1860 and 1870, the firm said.

Software introduced with the B1800 includes an enhancement of Burroughs' distributed processing capability so the systems can be used either as hosts or as terminals in remote job entry mode.

Audit entry software allows the user to get formatted information on either cassette or minidisk, he added.

The B1800 series also features virtual memory capability and multiprogramming under the Master Control Program (MCP).

Up to 14 individual channels for I/O and subsystems can be accommodated on a B1800. I/O units include removable and nonremovable disk storage, line printers, document readers and sorters, magnetic tape and cassette drives, an industry-compatible minidisk, card devices, a console printer and displays.

System prices range from $2,600/mo or $108,700 for a typical B1830 with 48K bytes of memory, 4.6M bytes of disk, a 160 line/min printer and a 300 card/min reader to $6,500/mo or $275,000 for a B1870 with 128K bytes of memory, 5.9M bytes of system disk, 130M bytes of disk, a 750 line/min printer and a 600 card/min card reader.

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COMPUTER ASSOCIATES

In View of Technology, Economics

Hybrid Services Feasible and Preferable: Hopewell

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. – Hybrid services which include computing and communications are not only technologically feasible, they're economically preferable, according to Lynn Hopewell, chairman of the IEEE Computer Society Committee on Computer Communications and senior member of the executive staff of the Computer Sciences Corp.

Speaking at a planning conference held by the Federal Communications Commission (FCC) here last week, Hopewell told his audience their challenge is two-fold: "to allow the regulated carriers freedom and incentive to use computers advantageously" and "to avoid suppressing imaginative entrepreneurial provision of new services in the marketplace by holding the specter of regulation over such enterprise."

As the technologies that make up telecommunications merge further, hybrid systems will gain greater acceptance, Hopewell maintained.

Hopewell suggested to the members of the FCC that hybrid systems, and computer communications as a whole, are part of "a 'revolution' firmly rooted in history."

That history goes back to the commercial revolution of the 15th through 18th Centuries, he said. During this period the decline of feudalism led to the emergence of the national state which, in turn, resulted in stability, the Renaissance, science, discovery and wealth.

The industrial revolution took over then, bringing with it the decline of mercantilism and guilds; the notions of individual rights and protection of property; the convergence of stability, trade expansion, markets and inventions; and the joining of science, capital and markets, Hopewell stated.

The energy era, lasting from 1760-1860, saw substitutions of new energy sources for human labor; the electronic era, from 1860-1950, experienced new ways of communicating; the information era, which began in 1950 and, according to Hopewell, is in progress today, involves new ways of manipulating and creating information.

Just as the development of transportation allowed the conversion of cottage industry to the factory system, telecommunications permits the distribution of computer "factory" products to users, Hopewell argued.

CW at FCC Meeting

Large Corporation Acceptance

Seventy-five percent of the top 500 industrial corporations are using computer communications, Hopewell said, quoting "the gurus" at International Data Corp.

These companies are concerned, he added, with the control of their business operations – with better information flow, cost savings and productivity increases and scientific management.

Computer communications already has a wide variety of users – from law enforcement organizations and brokerage houses to health, insurance, banking and retail institutions, he told the FCC.

Wide Variety of Users

More consumer-oriented applications are on their way, particularly those which use a Bell Touch-Tone phone as a terminal, but they haven't arrived yet, Hopewell said.

Out of an overall computer market of some $20 billion this year, an estimated $6 billion, or 30%, will be spent on computer communications, he stated, calling this field "the fastest growing, most dynamic sector of the computer industry."

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FCC 'Quizzed' on Conferencing

By a CW Staff Writer

WASHINGTON, D.C. – "Suppose you are an imaginative entrepreneur and, after much market research and business planning, you are presenting your plan for offering computer conferencing services to the public," Lynn Hopewell, chairman of the IEEE Computer Society's Committee on Computer Communications, suggested to members of the Federal Communications Commission (FCC) assembled here last week.

"A member of your group of potential backers asks: 'I see you are providing a service that seems to be both DP and communications. Will your business be regulated by the FCC?' "

Hopewell's scenario and question highlighted the focus of an FCC planning conference prepared by the American Federation of Information Processing Societies (Afips) to explain the technical concepts involved in telecommunications for the federal agency.

Should computer conferencing – a service that uses shared computer files, remote terminal equipment and telecommunications networks for group communications – be regulated by this federal agency, even when the agency isn't sure? Hopewell asked.

He described the imagined business further: "You will provide terminals to subscribers and arrange for all communications and computer facilities required. Your subscribers will pay only a monthly fee and will not own any equipment or deal with the telephone company.

"Also, your system design architect has told you the lowest cost system will require some text editing to be accomplished in the subscriber terminal."

Wrong Answers

Returning to the question of regulation, Hopewell noted, "If you answer that your service is only DP, surely you must be in error. The basic, fundamental task being performed by computer conferencing is the exchange of messages among different parties.

"If you answer that your service is only communications, surely you must again be in error. The usefulness of the message exchange process would almost entirely disappear if the DP functions (e.g., text editing, delayed and filtered message retrieval) were not performed," he added.

The fundamental service offered is message exchange, Hopewell argued. "You – the entrepreneur – must do business as a common carrier," he concluded.

On second thought, though, "if you are a regular common carrier, the FCC regulations require that you offer DP functions only through a separate subsidiary," Hopewell noted.

But that is "impractical, given the intertwined nature of the total service," he added.

Then the user must become a "resale" common carrier, a brand of communications vendor exempted under FCC rules in such a way as to be able to offer DP services, Hopewell said.

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Privacy Act Hit as Administered But Not Enforced

By Nancy French
Of the CW Staff

CHICAGO – If the Privacy Act of 1974 hasn't cost the Federal government a great deal and works all right, why is privacy legislation too costly and too much of a burden for the private sector?

Jack Osborn, director of Purdue University's Information Privacy Research Center, addressed that question here last week by saying, "We don't really know that it 'works' in the government because the law isn't being 'enforced' – it's merely being 'administered.' "

Speaking at an Info '76 session on the implications of privacy legislation, Osborn pointed out the Office of Management and Budget (OMB), the agency charged with "implementing" the Privacy Act, is the President's office of management and budget – an agency with no "enforcement" powers.

In fact, OMB is merely "administering" the law, Osborn said.

Many civil servants claim the Privacy Act is working well in their agencies while others make no secret of the fact that their agencies are "in technical compliance" and that's about it, according to Osborn.

Further, since the Justice Department – an organization with true enforcement powers – has established no organization to deal with privacy violations, litigation is a citizen's only recourse, Osborn said.

The Privacy Act of 1974, which applies only to federal agencies, requires that collected personal information be accurate, relevant and timely. It gives individuals the right to access and correct their government records and forbids information collected for one purpose from being used for different purposes.

The privacy issue is more than a matter of individual privacy – it's a political, emotional issue of "information control," Osborn said.

The thinking on the subject is still pretty hazy since information currently available is largely anecdotal; research completed to date has been limited mostly to present practices, he added.

No one has yet performed an in-depth analysis on a government agency to determine how compliance with the act affects its basic functions, he noted, and no one has done a "what-if" analysis on how different types of privacy laws would affect private industry.

The cost of privacy model – the strategic planning model developed by Robert Goldstein and published by Honeywell Information Systems – comes closest to the kind of "what-if" model Osborn believes is needed, he said.

While the model cannot really be used to estimate exact costs, it can be used to measure the degrees of difference in cost of various approaches, he said.

No matter what type of approach such a private-sector law takes, the individual caught in the middle will be the DP manager, according to James I. Cash, former director of the Purdue University computer center and presently a professor at the Harvard Graduate School of Business Administration.

CW
At Info '76

The DP manager will be faced with implementing new security measures including audit trails and threat-monitoring systems (in which invalid access attempts are monitored) to protect records.

A combination of data-independent access as well as data-dependent access systems will have to be implemented to make sure only authorized users can obtain sensitive personal information, he said.

Purdue's Information Privacy Research Center recently raised $250,000 in grants from a number of private sector organizations, including the Ford Foundation, TRW, Inc., Sears Roebuck, General Motors, IBM and Pittsburgh Plate and Glass, to do more research on the economic impact of privacy as well as societal attitudes toward privacy.

One phase of the study will examine how personal records are actually kept in eight organizations and another phase will look at employees' perceptions of how information is kept, according to Howard Fromkin, associate dean of Purdue's Krannert Graduate School of Management.

Role of Corporate Auditors Expanding Into DP

By a CW Staff Writer

CHICAGO – As a company's accounts receivable and inventory records disappear into computer data bases, auditors must audit corporations "through the computer" to assure the company is keeping its financial records in accordance with accepted standards of practice, according to John Koretz, manager of computer auditing for Coopers and Lybrand.

Rather than checking "totals" as auditors do in a manual accounting environment, DP auditors check the functioning of computer programs because the computer will always process the data exactly the same way as long as the programs are not altered, he said.

Several techniques are used, Koretz noted. The auditor can prepare computer programs to perform skeletal portions of the user's system as a test; he can write computer programs to extract data from the client's system to analyze; he can analyze the client's computer programs with audit software; or he can simply read program source code.

To certify a data base system, the auditor must make sure the data access controls are in place in order to assure the data base is accessed not only by authorized individuals, but also by authorized programs, he suggested.

One technique is to extract shipping data and billing data from the daily raw transaction file and compare the two. If the totals match, the programs are operating correctly, he indicated.

These types of extraction analyses can be done several times a year using a number of different input and output items at very little cost, he said.

Every time data is moved or transcribed, there is a risk it will be lost or garbled, Koretz noted. Parity checking is one way to reduce this risk.

In parity checking, one bit is added to each group of six, seven or eight bits in order to make each group adhere to a rule such as odd or even count. Any single-bit error will result in a variance.

Check digits enable the user to detect multiple-bit errors and even allow automatic detection of some errors, he said.

Management Underutilizing DP For Planning, Speakers Agree

By a CW Staff Writer

CHICAGO – Corporate planners are to corporations what the National Security Council is to the White House – a think tank, according to Prankash Shah, director of management sciences for Time Sharing Resources, Inc. of Great Neck, N.Y.

In remarks prepared for Info '76, Shah described this think tank as a group of generalists with a broad range of abilities who are able to focus attention on each problem area as it emerges.

Quoting the Canadian author Henry Mintzberg, Shah pointed out, however, that management by computer-aided techniques and planning is not yet the norm in American industry. Most managers still make decisions based primarily on hunches and personal judgment, he said.

Significance in Dispute

While the majority of corporate planners would agree on the need for some computerization in the planning function, not all attach equal significance to it.

For example, Eric White, an economist with Townsend, Greenspan & Co. believes an understanding of the dynamics operating at any point in time must be included in the thorough analysis of a model's output to determine if the results are accurately describing the current and most probable future outlook.

On the other hand, several large banks that have traditionally been reluctant to embrace "wild new ideas" have jumped on the technology bandwagon, as evidenced by their new electronic funds transfer systems, Shah said.

In addition, many other new banking products rely heavily on the latest computer technology, he added.

The Chase Manhattan Bank, for example, owns an econometric consulting company, Chase Econometrics, which uses computers extensively in forecasting.

Computer modeling has become more successful as more timely data and information on key economic and business parameters becomes available, Shah added.

Role of Data Banks

"Large-scale centralized data banks of international economic and financial data coupled with internal company data have facilitated modern econometric-based modeling," according to Dennis O'Brien, vice-president of Data Resources, Inc., a firm that provides such data.

Product line forecasting, for example, in which a company's product sales are related to the economy and also the company's internal management policy, allows "what-if" analysis of corporate strategy in response to the economy, O'Brien noted.

The impact of these new approaches to corporate planning has considerable impact on the financial management sector of a company, Maria Honczarenko of Nabisco said.

Honczarenko suggested "phased-in implementation," an approach that she said worked for Nabisco. "Initially, systems effort was concentrated on satisfying the immediate critical requirements of the divisional management coupled with some flexibility to respond to ad hoc requests and key management questions," she explained.

"As Nabisco personnel became more comfortable with the approach, the system was improved and made more complex without major redesign," she said.

Flexibility Suggested

Computer models should be more flexible so they can adapt to problems more readily, Shah suggested.

When management sciences were in their infancy, the typical application tended to put into place a particular model to solve a particular problem. This was costly and time-consuming and often produced answers that were "too little too late," he said.

Managements are now looking more favorably on ongoing planning methods that are based on new technology and improved software, according to Shah.

United Air Lines has developed a financial planning model that helps transportation managers determine the impact of schedule changes on the profitability of the company.

"The model allows managers to test proposed schedule offerings and evaluate their effect on a wide range of operating parameters," he said.

Complexity Limits Econometrics

CHICAGO – Econometric forecasting, if not constrained within certain judgmental parameters, can easily become an exercise in wishful thinking or what Paul Samuelson calls "nominating ideas."

This is because the economy, particularly that of the U.S., is a very dynamic and complex machine with a myriad of interactions and quickly changing technological and behavioral trends, Prakash A. Shah told Info '76 here last week.

No model, no matter how complex and brilliantly conceived, is capable of capturing this temperamental entity, he said.

Quantum Leap

Shah, who is director of management sciences for Time-Sharing Resources of Great Neck, N.Y., pointed out the last several years have seen a quantum leap in the direction of improved and readily available data which forms the primary input to econometricians' work.

Simultaneously, software has been refined and is now available in user-oriented form, "freeing the economist from the stranglehold of computerese."

Today, the economist is more able to communicate the dynamics of the economic system to company management in a timely manner, Shah said.

Basic Forecasting Types

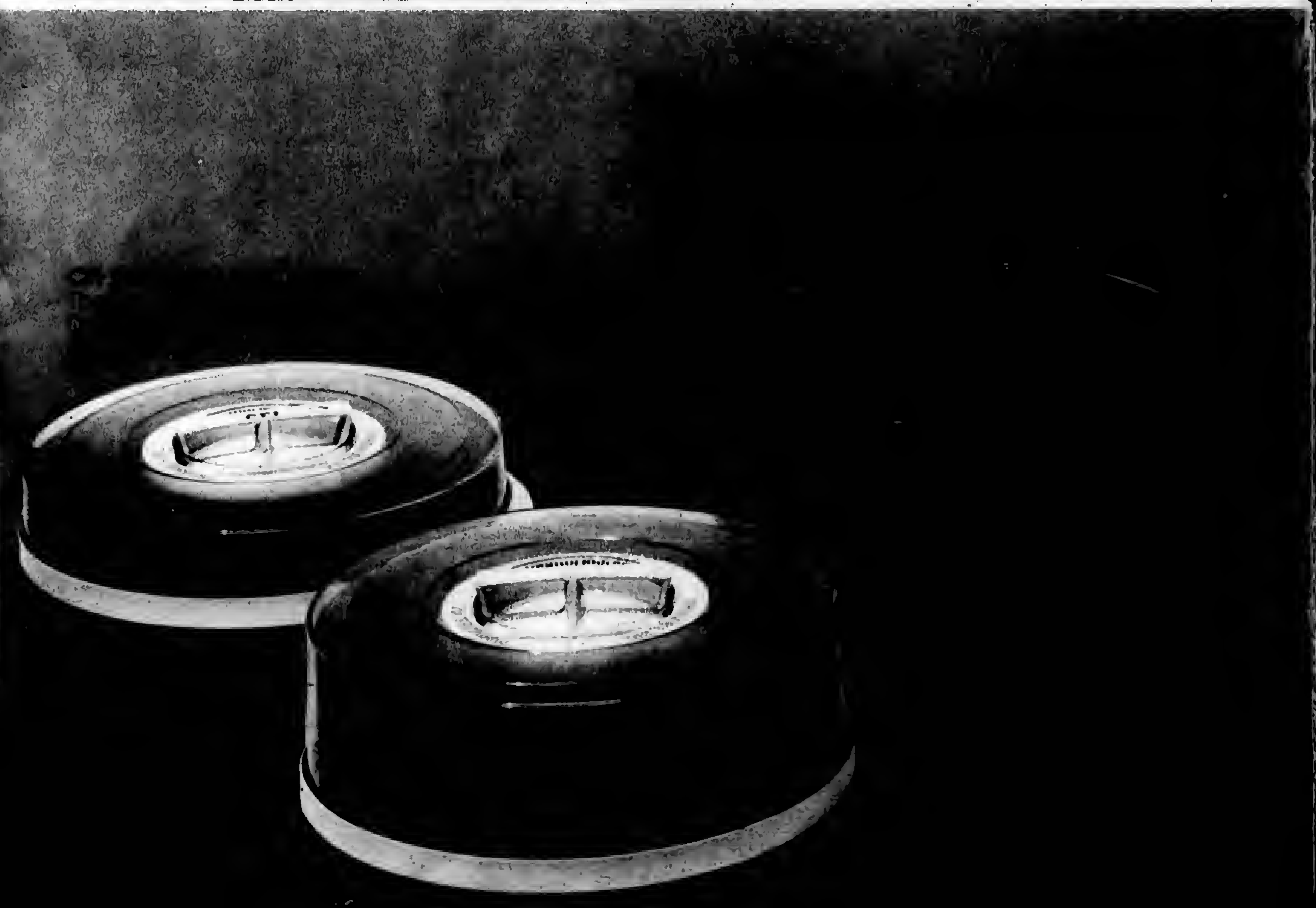
There are two basic types of forecasting: long-range, which Shah described as longer than one year, and short-range, or one- to 12-month periods of time.

Those categories break down still further – into aggregate vs. detailed forecasting, according to Shah.

Aggregate planning might include such things as product groups, one plant, the entire company or the whole industry, for example, whereas detailed forecasting might consider only a single product, he explained.

Forecasting by objectives is done using management-supplied objectives – a type of forecasting typically used when there is a lack of historical data or when turning points and technological change nullifies the ability of history to predict the future.

Analysis, on the other hand, is forecasting based on the projection of historical trends and relationships into the future, Shah said.



And to Focus on Objectives

'Scenarios' Suggested to Aid Management Choices

By Nancy French
Of the CW Staff

CHICAGO – DP systems will help a corporation attain its goals only if it is focused on the company's primary objectives, James Kinney, a consultant with Cresap, McCormick and Paget, Inc. said here last week.

Speaking at an Info '76 session on DP management, Kinney said management information systems (MIS) managers must work with top management to assure DP planning is a part of the corporate planning process. Kinney suggested the scenario approach as one method that has proved helpful in establishing a dialogue with the people at the top.

Understanding Limited

Because top management has a limited understanding of MIS, including the capabilities of DP technology as applied to the business system, and even less knowledge about the specific needs of a business system in terms of DP performance, breadth and application, Kinney suggested the MIS manager develop a set of scenarios, or givens, in business – not DP – terms.

These scenarios would offer choices to management and provide it with a clear idea of the results of those choices as well as their costs, he explained.

System Description

Each scenario would describe the operation and capabilities of a proposed information system in support of a business, Kinney said. The introduction could include a description of the business including key factors such as markets, products and its important characteristics; an analysis of the business environment; and specific assumptions describing the corporation's intended participation in the business derived from the strategic objectives developed at the start of the planning process.

This introduction establishes the basis of the dialogue between the MIS manager and the company's top management, Kinney said. The remainder of the scenario describes alternative types of information system capabilities that could be established to correspond to the business development assumptions agreed to at the start of the planning process, he explained.

The scenarios can be used to determine the extent of computer-based transaction processing the new business plan will require, for example, or whether an integrated data base will be needed to support the information systems, he added.

They can also help determine the degree of computer dependency the firm's management wants to build into the business operation, he said.

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Three Givens Suggested

A future plan should be developed allowing for three sets of givens. Numbers of locations could be one variable, for example. The first might provide for three locations, the second for three plus a satellite and the third for three large locations with multiple satellites.

The second variable might be number of customers. Here, one scenario might call for 300 to 500, the second for 700 with 175 customers dealing with the satellite and the third, 1,000 to 2,000 customers, he suggested.

As for the relationship between the locations, one scenario might provide for three stand-alone warehouses, the second for a satellite warehouse drawing on a central warehouse and the third, a satellite warehouse with interwarehouse shipments.

Projected annual sales volume could be another variable that would help determine the information system needed, as would the type of order entry – from daily update or on-line inquiry and batch daily update to an on-line interactive system as the third choice.

In the area of billing and accounts receivable, three choices could be offered – weekly batch posting, weekly or daily cash posting or weekly on-line cash posting, he said.

Another variable might be annual sales volume, he added.

Inventory Control

As for inventory control, Kinney said top management could be offered a choice of daily update within each individual location, daily update of a central file or on-line real-time central file inventory control.

Finally, in the area of order scheduling, the first and second scenarios might provide for manual order scheduling while the third could provide for computer-generated order scheduling, he suggested.

Equipment Configuration

Equipment could be handled in the same manner, with the first scenario providing for stand-alone systems at each location, the second calling for a centralized system providing service to each location and the third providing for a network connecting the main warehouses with satellites operating off-line in a distributed data base system.

Cost should be calculated as part of each scenario, Kinney pointed out, so management knows it could vary from 2% to 3% of sales for the simplest system and from 5% to 7% of sales for the "Cadillac version."

Guide to Privacy Act Available

McLEAN, Va. – A 200-page guide on the technical impact of the Privacy Act of 1974 and how to comply with its requirements has been published by Systems Development Corp.

Entitled *The Privacy Act of 1974: A Reference Manual for Compliance*, the book provides an outline of the act's basic requirements and examines the technical considerations in implementing the law for automated systems of records.

It also presents an analysis of the legislative intent behind the requirement to "establish appropriate safeguards."

Copies can be purchased for $15 each from Systems Development Corp., SDC-Privacy Project, 7929 Westpark Drive, McLean, Va. 22101.

MSS Not Sparking Interest of DPers: Freeman

By Toni Wiseman
Of the CW Staff

CHICAGO – Very little has happened in the area of mass storage systems (MSS) in the last two years, attendees at Info '76 were told here last week.

While there have been some very interesting technology developments in the field, there has been little commercial interest kindled despite the large amount of time and money federal research agencies have invested, according to Dr. David N. Freeman, a senior associate of Ketron, Inc.

By 1974, six different MSS had been announced for commercial availability and there have been rumors of overseas efforts by International Computers Ltd. and Siemens.

The Ampex Terabit memory uses a large reel of video-recorded tape to store 5.5 billion bytes of data. It is interesting, Freeman noted, that Ampex has been able to exploit a product – video taping systems – developed for a very different industry.

The California Computer Products, Inc. (Calcomp) automated tape library, on the other hand, utilizes an elaborate storage and servo mechanism to automatically retrieve, mount and dismount conventional mylar tape reels, he said.

Control Data Corp.'s 38500 is based on a mylar cartridge, while Grumman's Masstape uses a mylar cassette and IBM's 3850 uses a video cartridge, he added.

Finally, Precision Instrument's System 190 offers mass storage on a coated pack strip, using a laser beam to burn microscopic holes in the Rhodium-plated strips of Mylar, which it can subsequently sense with a lower powered laser beam.

By late 1976, approximately 50 commercial MSS will have been installed.

Throughout the decade of 1966-1976, commercial interest has remained relatively low for a number of reasons, both technological and business, Freeman said.

"First of all, the rate of magnetic disk improvements has been as great as most installations could assimilate," he said. Within the decade, IBM moved from its 7M-byte 2311 drive to the 30M-byte 2314, the 200M-byte 3330-11 and finally to the 317M-byte 3350, he noted.

"Other manufacturers have matched IBM in these capacity increases which have produced an annual unit cost decrease of 15% during the decade," he added.

Magnetic tape technology has also kept competitive with disks for archiving and sequential processing functions, Freeman said. Tape densities have increased from 800 bit/in. to 1,600 bit/in. and then to 6,250 bit/in., he noted.

"Although not as dramatic as disk capacity increases, this has served to maintain tape's dominant role for archiving.

"The unit purchase price for tape reels has remained in the $12 to $20 range, whereas disk packs have typically rented for $15- to $20/mo.

"Hence, installations with large numbers of unconnected applications have used tape for private storage of files and programs due to cost considerations," he said.

Uncertain of Need

Another factor hindering the widespread use of MSS was the uncertainty of a need for a third level in the storage hierarchy, Freeman told attendees.

Many of the largest on-line installations, such as airline reservation systems, required random-access response times of three to five seconds. None of the MSS devices developed during the last decade has been able to meet this performance level, he said.

"Even today, no announced or unannounced MSS device can store 10 billion bytes on-line with the capability of retrieving any 100-byte record at random in an average of five to 10 seconds.

"The only approach furnishing this capability has been a roomful of disk drives, logically organized so that active subfiles are located on different drives," he said.

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The trend towards distributed data bases has also been a deterrent. In 1970, firms normally had three to five large computer centers containing most of the data, Freeman said.

By 1975, the trend was one or two computer centers containing summary master files with cartridges, floppy disks and cassettes furnishing reliable, fast-access local data bases at branch offices, he maintained.

"Finally, the hardware reliability of MSS devices is unknown – hence, worrisome – and adequate file organization support may be years away," he stated.

To illustrate his point, Freeman noted IBM's first commercial effort for a large-capacity, slow-access device, the 2321 data cell, had serious problems, including a low average transfer rate, uniqueness within most configurations, unreliability of the transport and read/write mechanisms and inappropriateness for data base applications because of response time.

Who needs mass storage technology today?

"Most installations requiring at least 20 billion bytes of on-line storage need MSS, while none requiring less than 5 billion bytes do," Freeman said, noting that with current disk technology, 20 spindles can satisfy a five billion byte requirement cost effectively, "although response times are much faster than are required for most applications."

In the grey area between five billion and 20 billion on-line bytes of storage, the decision to go to MSS or not depends largely on the rate of growth for the particular installation, he said.

"It is interesting to note that IBM has so far been selling 3850s primarily as replacements for magnetic tape, in particular, for libraries of a few thousand tape reels, which are active files for various applications.

"To date, few IBM installations have planned to replace many of their disk subsystems with 3850s, even though IBM's announcement and promotional literature emphasizes the reliability and cost-effectiveness of 3850s for on-line applications," Freeman said.

No Positive Reasons

Commonly, the precipitating factors for seriously considering a major change in storage devices are imminent exhaustion of computer room space or imposition of an enormous new application on an installation, he noted.

Unfortunately, he said, there do not seem to be any positive reasons for moving to MSS, neither new functions, improved system responsiveness nor improved mainframe utilization.

"Any function or response achievable with MSS devices can be more easily achieved with conventional disk subsystems," Freeman said.

As Court Action Indicates

Users, Vendors Eagerly Attacking Software Tax Laws

By Molly Upton

Of the CW Staff

If the number of lawsuits and hearings is any indication, users and vendors are becoming increasingly eager to attack the morass of state and local laws governing taxation of software and DP services.

Although many of the cases cropping up are distinct, the definition of intangible personal property – which in many states is not taxed – is the common thread.

However, the complexities arise when one considers the premises on which a state or locality is seeking to collect taxes.

In some states, work done on punched cards is considered "processing," which is taxable.

In other instances, disputes arise over the definition of "tangible" and "intangible" property and the determination of what is of substance to the user, the medium or the message.

Taxation Opponents

Opponents of software taxation have argued the data contained on various media is what is of value to them and this data is intangible.

In some states, software transmitted directly to a computer via communications is not taxed while the same software contained on magnetic tape, for instance, is taxed. That software can be transferred this way makes it intangible, they argue.

Another criterion is to equate intangible property with that which has value for a very long period of time. The arrangement of data, or "precisely scattered electrons forever," is what is of substance to the user, not the media itself, they argue.

There are reports that several states are awakening to the fact they may be sitting on a big source of revenues that can be mined by taxing software.

New York State, for example, "reinterpreted" its tax statutes recently and declared software and various DP services taxable [CW, Nov. 1].

And in Birmingham, Ala., Central Computing Services, Inc. (CCS), a subsidiary of Central Bancshares of the South, took on the State Department of Revenue and won in a lower court verdict that ruled software was intangible and not taxable.

However, the case is being appealed in the circuit court of the 10th Judicial Circuit of Alabama, according to Dewey H. Crim, CCS president.

The CCS case began when the Department of Revenue assessed CCS a retroactive use tax on its banking packages obtained from University Computing Co., Crim said. The total sought by the state for the use tax and penalties between July 1, 1971 and June 30, 1974 was $13,519.91.

CCS argued the software contained on the packs or tapes was intangible and the medium was inconsequential – the same conclusion a Tennessee court reached in The Commerce Union Bank vs. George M. Tidwell. CCS attached a copy of the Tidwell case to its brief.

The president of a DP services firm has told Florida officials that a state statute taxing software is unconstitutional. See story on Page 14.

In Statistical Tabulating Corp. vs. Bob Bullock, a case arising out of a dispute between the keypunching firm and the Texas comptroller of public accounts, an Austin, Texas, appeals court ruled keypunching is a service and is therefore exempt from Texas sales tax.

Part of the Texas sales tax ruling provided that tax can be collected when a customer furnishes, "either directly or indirectly, the materials used in the producing, fabricating, processing, printing or imprinting" processes.

The court found the only materials contributed by Statistical Tabulating's customers were "data, information and statistics which are intangible products of accounting, research or records."

Statistical Tabulating provided punched cards on which it had already paid a sales tax.

"It may not be assumed or implied that the legislature intended also to tax intangible data as materials furnished by a customer wanting the data transferred to cards suitable for computer calculations or recording," the court ruled, noting the legislature made it clear the tax should fall only on "tangible personal property."

A rehearing on the case was denied July 7.

Statistical Tabulating brought the action in June 1974, after it was assessed over $20,000 in taxes. The appeals court's ruling, which directed Statistical Tabulating to recover its taxes, reversed a judgment of the district court which had awarded the firm nothing.

Tax Credit Sought

Others are using a district court ruling in a case filed by Texas Instruments (TI) to demonstrate software is intangible.

TI filed suit against the Federal government for the right to take a tax credit on seismic data contained on magnetic tapes. But last March the District Court ruled TI was not entitled to such a tax credit because the data on the tapes was intangible.

The court held that TI's "real" investment was not in the tangible computer tapes themselves but, rather, in the seismic information which it collected.

Once collected, that information would and could not wear out," the court held.

"True, technological innovation might render the information useless, but unlike a bulldozer or a conveyor belt, the collected information would remain trapped in precisely scattered electronics forever," the court said.

TI has appealed the case.

Awards Competition Slated

CHICAGO – *Control Engineering* magazine has announced a "Call for Entries" in an awards competition designed to recognize significant energy-saving achievement by people engaged in control engineering.

The awards competition is part of *Control Engineering's* commitment to promoting energy-saving control systems in the manufacturing processes.

Awards will be given to a particular plant, factory or facility which has installed a specific control system since September 1973 that had the conservation of energy as a major design objective.

Winners will be honored at a banquet and reception here on April 12.

For further information on *Control Engineering*'s Energy Conservation Awards Program contact Alan Laduzinski at 222 S. Riverside Plaza, Chicago, Ill. 60606.

Discriminates Against 'Software Persons'

Florida Tax Statute Attacked as Unconstitutional

By Molly Upton
Of the CW Staff

MIAMI – The president of a DP service firm here believes the Florida tax statute under which personalized and customized software is taxed is both inconsistent and unconstitutional.

Last week, he presented his argument before a Divison of Administrative Hearings in an effort to have the statute voided.

The statute at issue is 12A-1.32, which Nova Computing Services, Inc. President Robert Sherrin contended is contrary to federal and state laws and was adopted in a manner that violates certain principles of the procedure.

The rule is unconstitutional because it fails to provide "software persons" equal protection under the law, he argued.

Furthermore, statutory authority is violated because the ruling contradicts Florida statute 212 which exempts "professional, insurance or personal service transactions which involve sales as inconsequential elements for which no separate charges are made," he claimed.

An expert witness for the defense indicated he thought software was a personal service and should be exempt, Sherrin said.

Software as Personal Property

The statute in dispute provides "a software package, which includes such items as instructional material, prepunched cards or programmed tapes, is construed to be tangible personal property and the entire charge, therefore, is taxable, including the services of a technician to assist the customer in the use of the package whether or not his services are separately itemized on the billing. The same ruling applies to customized program packages."

The Division of Administrative Hearings is empowered to strike all or part of the statute, Sherrin said. A ruling is expected within three months.

The case, known as Nova Computing Services, Inc. vs. Reuben O. Askew, governor, et al and Information Consultants to Management, Inc. and Isis Corp., arose when Nova was assessed taxes on some software it purchased for its Cincinnati Milacron computer.

Although Nova's principal business is contracting out keypunching jobs, Sherrin said he recognized the importance of software taxation and decided to try his own case with the aid of lawyers.

Sherrin said he has been proceeding under an administrative procedures act, which has expedited the process tremendously.

Inconsistencies Cited

It is inconsistent that software on punched cards, paper tape or paper is taxable whereas software on magnetic tape, disk or direct transmission to the computer is exempt, Sherrin claimed.

Magnetic tape is tax exempt because no change of property title occurs as tapes are usually returned after use, he said.

But, he asked, what about keypunched cards which are furnished by the customer "where clearly no change of title of property takes place"?

"Information on magnetic tape being exempt from sales tax, therefore, requires that information on any communications medium be exempted from sales tax," Nova argued.

A court reporter's paper tape also is exempt whereas a software person's paper tape is taxable, he pointed out.

The respondents, Askew and the other parties, defined software as "the data recorded in a software package which is used to enable the computer to perform specific data processing operations."

In Sherrin's opinion, the above definition includes punched cards.

Statute Conflict

Another aspect of the conflict between statutes 212 and 12A-1.32 is that 12A-1.32 results in the taxation of Florida taxpayers for alleged tangible personal property.

These same taxpayers are deprived of the Investment Tax Credit benefits and the depreciation of tangible personal property because the Federal government construes these to be intangible property, Sherrin observed.

Nova cited recent cases in Texas and Tennessee in support of its argument.

In Statistical Tabulating Corp. vs. Bob Bullock, comptroller of public accounts, the Court of Civil Appeals of Austin, Texas ruled that software utilizing cards as a communications medium is exempt from State of Texas sales tax, Sherrin said.

In Texas Instruments vs. U.S. last March, the court ruled that software data on a communications medium is intangible in nature because of its relative value and permanence, and the communications medium is an inconsequential element of intangible software.

In Tennessee, The Commerce Union Bank vs. George M. Tidwell, commissioner of revenue, exempted software from taxation [CW, Aug. 30].

"It is merely incidental that these intangibles are transmitted by way of a tangible reel of tape that is not even retained by the user," the court stated.

On procedural matters, Sherrin argued the state rule authorizing the taxation of software was adopted in an irregular manner. A Florida statute that calls for revamping Florida's state administrative procedures covers all prior proceedings and rules with few exceptions.

Hearings were held on other previously enacted laws; however, Sherrin pointed out, at no time was consideration given to the tax ruling which was passed only a few days before the administrative procedures act.

Executive Guide Offered

SAN ANTONIO, Texas – Datapoint Corp. is offering a new 20-page brochure, "An Executive Guide to Dispersed Data Processing," which describes in nontechnical language the dispersed processing concept and its significance for the business executive.

The brochure includes explanatory illustrations of functioning networks and the ways in which dispersed processing systems and peripherals can be integrated into central computer operations.

It also outlines the economic advantages and operating features of dispersed processing equipment used for data entry applications and other field office assignments.

A copy of the booklet may be obtained from the firm's Marketing Communications Department at 9725 Datapoint Drive, San Antonio, Texas 78284.

Amdahl: The Man and the Mainframer

CW Profile

By Molly Upton
Of the CW Staff

SUNNYVALE, Calif. – "There's room for more mainframers, but if too many try to enter there isn't room for anyone," Dr. Gene Amdahl said in a recent interview.

The first of the new mainframe manufacturers to offer IBM-compatible machines, Amdahl warned a shakeout, if not obliteration, could occur in the mainframe arena if vendors don't guard their profit margins to ensure future research and development.

The chairman of Amdahl Corp. and recipient of the Data Processing Management Association's Man of the Year Award also highlighted the significance to users of the growing impact of microcomputers and the increased capacity and new technologies in storage.

Concerned About R&D

Explaining why he is concerned about the profitability of the industry, the maker of the 470V/6 said "the amount of profit that can be made from the operation can't be divided many ways before there is inadequate profit in any one organization to foot the cost of development of new products."

Amdahl criticized firms that get "their share" of the business by cutting prices rather than offering a unique product.

Cutting prices "seems to benefit everybody," but if manufacturers drop prices to the point where they can't support advances in the state of the art, "it's not even in the user's interest," he said.

Vendors entering the mainframe arena must plan rationally for their future or they won't have a future – nor will their competitors. R&D has "a big price tag" and the money has to come from somewhere, Amdahl said.

Amdahl described National Semiconductor Corp. with its recently announced line of IBM-compatible CPUs to be marketed by Itel Corp. [CW, Oct. 18] as "awfully late with something that's probably a marginal product."

Distinction From Itel

Amdahl made a distinction between National Semi's and Amdahl Corp.'s approaches by saying "National is just replacing a section of the market down below where they give a little better price for the same performance.

"We are providing machines for growth the equivalent of which are not available from any other source. To a certain extent, we are contributors rather than vultures.

"But I guess we need vultures, too," he added.

Perilous But Open

The former IBM system designer ventured into the IBM-compatible CPU business despite signs that other mainframers had perilous viability because he "saw what the opportunities were, and what services weren't being provided.

"I started in the era when it was clear that RCA and GE were soon going to go out of business, and I was quite sure Xerox would too.

"But I felt they started down the wrong path in the sense they weren't serving the customer needs; they were aiming at the high revenue part of the IBM marketplace," he recalled.

"Itel's doing the same thing" by not providing anything unique but selling cheaper than IBM, he said.

"That doesn't leave you viable for any move that IBM makes" such as cutting prices or offering new products, he added.

Furthermore, Amdahl Corp. is serving a customer Amdahl indicated IBM doesn't serve well – the large user. IBM doesn't serve this user because "it's too small a market, it's not in IBM's own best interest," he explained.

Amdahl Corp. decided to make its system compatible with IBM because users have spent $200 billion on IBM systems and software since the inception of the 360, he said.

But while IBM compatibility is important, it means "we're more vulnerable. It's a high risk, but it's not as high a risk as never being able to get into the business successfully," Amdahl said.

"You have to know you can provide a customer with a continuing advantage technically over the other sources of equipment for the foreseeable future," he said.

"That doesn't mean you have to know more about technology than IBM, but you certainly must thoroughly understand what things are in IBM's best interest and what aren't because you have to understand why IBM makes the choices it does," he added.

As for the future of the company, Amdahl would not rule out the possibility of entering the storage area, although he said it "would not be anything like what is seen today and would be different in more ways than one normally thinks about."

Looking at the changing DP environment, Amdahl said the greatest revolution will come from microcomputers.

Economic Factors

The economic factors that mitigated against applying computers to such functions as input tasks and local control aspects are no longer a stumbling block. For instance, he said, it may be economically feasible to make a microcomputer-based gas pump meter that "does a few little extra things and more than pays for itself. The things you're going to see coming into the fold of DP are going to come from areas where we never even thought about using it before."

"And that's going to be revolutionary, although it will be done by people who largely are not what we think of as computer people today," Amdahl predicted.

"The other principle technology I think is going to make an impact is the technology that is going to allow us to replace rotating electromechanical peripheral storage devices by electronic storage, whether they are magnetic bubbles or electron beam addressable memories or however it's done. That will have to be the next major revolution.

"That will affect the whole spectrum of machines from small to large," he said.

"More memory is going to be the biggest impacting factor of all in large machines," he said. Technology advances will make possible enormous memories at costs comparable to those paid today for much more modest memories.

"People will use enormous memories, and will end up being able to do things much more effectively," he said. This quantitative change will actually produce a qualitative change in the way data processing is done, he said.

McCracken 'Very Concerned'

Vacuum Seen for Top Business DPers

By Edward J. Bride
Of the CW Staff

HOUSTON – "There is essentially a vacuum where some professional societies should be meeting the professional needs of senior business DP people," according to Dan McCracken, vice-president of the Association for Computing Machinery (ACM).

At a recent meeting of ACM's Special Interest Group on Business Data Processing (SigBDP), McCracken said he was "very concerned about the absence of any organization that does a really good job of meeting the needs of the senior technical people in business data processing."

There are "many thousands of DPers who are simply drifting professionally because no organization so far recognizes their needs and meets them," he said.

The Data Processing Management Association is oriented toward "present and aspiring managers" rather than senior technical people; the Association for Systems Management is geared for systems work, he observed.

Societies/ User Groups

"And ACM, which serves the needs of many groups superbly, does rather little in the business data processing area," he said.

SigBDP has done an "impressive and commendable job" in organizing relevant sessions at various annual meetings, he continued, but this effort "does not meet the total need" and "there is not much more you can do in that direction."

McCracken encouraged the group to improve its publication, *Data Base*, and to help stimulate and form new special interest groups.

Employment Opportunity

ATLANTA – An employment register will be featured at the Association for Computing Machinery's Computer Science Conference here Jan. 31 through Feb. 2 to help match computer scientists and DP specialists with potential employers.

DPers who wish to be included in the register must complete a form giving information on education, experience, publications, interests, references and position and salary desired. Anonymous forms will be accepted.

Employers must complete a similar form with information on positions available, starting dates, salary and benefits and requirements for employment.

The fee to job applicants is $5; student applications are free. The fee for employers is $20. The forms are available from Orrin E. Taulbee, Department of Computer Science, University of Pittsburgh, Pittsburgh, Pa. 15260.

Call for Papers

FOURTH ANNUAL CONFERENCE ON COMPUTER GRAPHICS AND INTERACTIVE TECHNIQUES, July 20-22, San Jose, Calif.

The conference, sponsored by the Association for Computing Machinery's Special Interest Group for Computer Graphics, will focus on computer graphics and interactive techniques. Papers are solicited on graphical theory, techniques, applications and education.

A short abstract is requested by Dec. 1 and should be sent to James E. George, Los Alamos Scientific Laboratory, P.O. Box 1663, MS 272, Los Alamos, N.M. 87545.

SUMMER COMPUTER SIMULATION CONFERENCE, July 18-20, Chicago.

The conference theme is "Simulation — A National Resource." Papers are requested on simulation methodology, hybrid systems, chemical sciences, physical sciences, environmental sciences, biological systems, managerial and social sciences, simulation credibility, energy, system engineering and simulation for training.

Three- to five-page summaries should be mailed by Dec. 15 to Dr. O.J. Manci, Vought Corp., P.O. Box 5907, Dallas, Texas 75222.

SYMPOSIUM ON MACHINE PROCESSING OF REMOTELY SENSED DATA, June 21-23, West Lafayette, Ind.

The symposium will focus on the theory, implementation and applications of machine processing for remotely sensed data. The program will be designed to provide an opportunity for researchers in scene analysis, DP and utilization to discuss current research results, new technological developments and new application of existing processing techniques.

Authors wishing to contribute long papers must submit a 1,000-word summary by Dec. 31. Short papers describing recent results will be selected on the basis of a one-page abstract due by March 18.

Both should be sent to Dr. John C. Lindenlaub, Laboratory for Applications of Remote Sensing, Purdue University, 1220 Potter Drive, W. Lafayette, Ind. 47906.

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Computerworld 11-1

Thanks to Training Center

Disabled People Enter Job Market as Programmers

BERKELEY, Calif. – Disabled people have entered the job market in the Bay Area as computer programmers, thanks to the comprehensive Computer Training Program of the Center for Independent Living (CIL) here.

Despite severe physical disabilities ranging from deafness and blindness to near total paralysis, more than half of the 12 who graduated from the course three weeks ago have been placed in jobs with such firms as IBM, Bank of America and Lockheed Electronics Co., according to CIL spokeswoman.

The center's training program was conceived in 1974 by IBM as the first nonresidential computer programming course in the U.S.

Funded by the California Department of Rehabilitation, the program gets technical expertise from local users and vendors, she said.

CIL's programming students use everything from sign language with interpreters to wheelchairs to complete 800 hours of programming training. In addition, the students receive on-site job experience and also learn how to live independently, she noted.

Students start out with Basic, which serves as the introduction to computers and DP, she said. They then move on to Cobol, Assembler Language, Job Control Language and a course on debugging, with the one week of job experience coming as a final portion of the studies.

Innovative, Successful Program

IBM, which "keeps close tabs on the program" in its advisory role, has recognized the project as "one of the most innovative and successful of the programs with which it has been associated," according to the spokeswoman.

The project also has a Business Advisory Board, representing more than 40 firms, including Del Monte, Bank of America, Arthur Anderson and Fireman's Fund.

Most of the state funds go to the program itself in the form of computer time and direct interfacing with computer systems, including a Control Data Corp. 6400, an IBM 370/158 and two minicomputers, she said.

'Have the Edge'

Since many of the students are handicapped to a great extent and did not attend public schools in many cases, CIL's standards are not as high as other, more formal schools and colleges, she said.

The students, however, "have the edge" over high school graduates, for example, because businesses would rather hire the program graduates than hire inexperienced people and train them from scratch, she said.

One of the center's continuing tasks, the spokeswoman declared, is educating business people right along with the program in an attempt to change attitudes about the severely disabled.

There is a problem, however, in that businesses which don't want the handicapped program graduates will find some other, legal means to avoid having to hire them, if they so wish.

Still, out of the seven students who graduated last year's course, all seven were placed and are still employed, she noted.

Computer training is one of more than 45 projects and services offered by CIL. The organization has become a principal national advocate for the expanding rights and opportunities of disabled people, she said.

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Editorials

EFT - Let's Slow Down

"Privacy: That's what freedom is all about. Any time a good deal of information is concentrated in one place, it constitutes a potential threat." Paul Armer, consultant.

"The key issue in the electronic funds transfer controversy is a need for a more efficient method for transfer of money to replace the two tons of paper that is used daily now." David Huemer, National BankAmericard.

Those two speakers recently presented clear-cut differences of opinion about the most important issues in the further development of electronic funds transfer (EFT) systems [CW, Nov. 8].

The differences are clear: The people in the banking and bank card industries see EFT systems as a method of increasing their internal efficiency, leading to higher profits. The opponents see the broad social and moral issues raised by such developments.

It is clearly easier to quantify and, therefore, study the economics of EFT systems than it is to really delve into the social and political questions raised by such systems, but those thornier questions must be considered before the U.S. rushes headlong into EFT development efforts.

No one will argue EFT does not mean real savings to banks, credit institutions and others involved in providing financial services. That question does not deserve any more study.

But just because such savings are possible and demonstrable does not mean we should pursue the development of the systems.

Many things may be more efficient than present ways of doing business, but efficiency should not be the only criterion on which technological developments are judged.

Such developments as EFT systems may well affect the freedom and concomitant right to privacy of American citizens – and all the security measures in the world might not be able to protect that freedom and privacy.

Unfortunately, much of the talk today in favor of EFT concentrates on the economic advantages of the systems and possible "Band-Aid" types of security measures.

Very little attacks the underlying issue: Is it consistent with the right to privacy to collect all information about an individual's financial affairs – from what he buys to where and when and for how much – in one place?

Until that question can be answered satisfactorily, Congress should place a moratorium on all EFT experiments.

Efficiency cannot be the watchword when basic human rights are at stake.

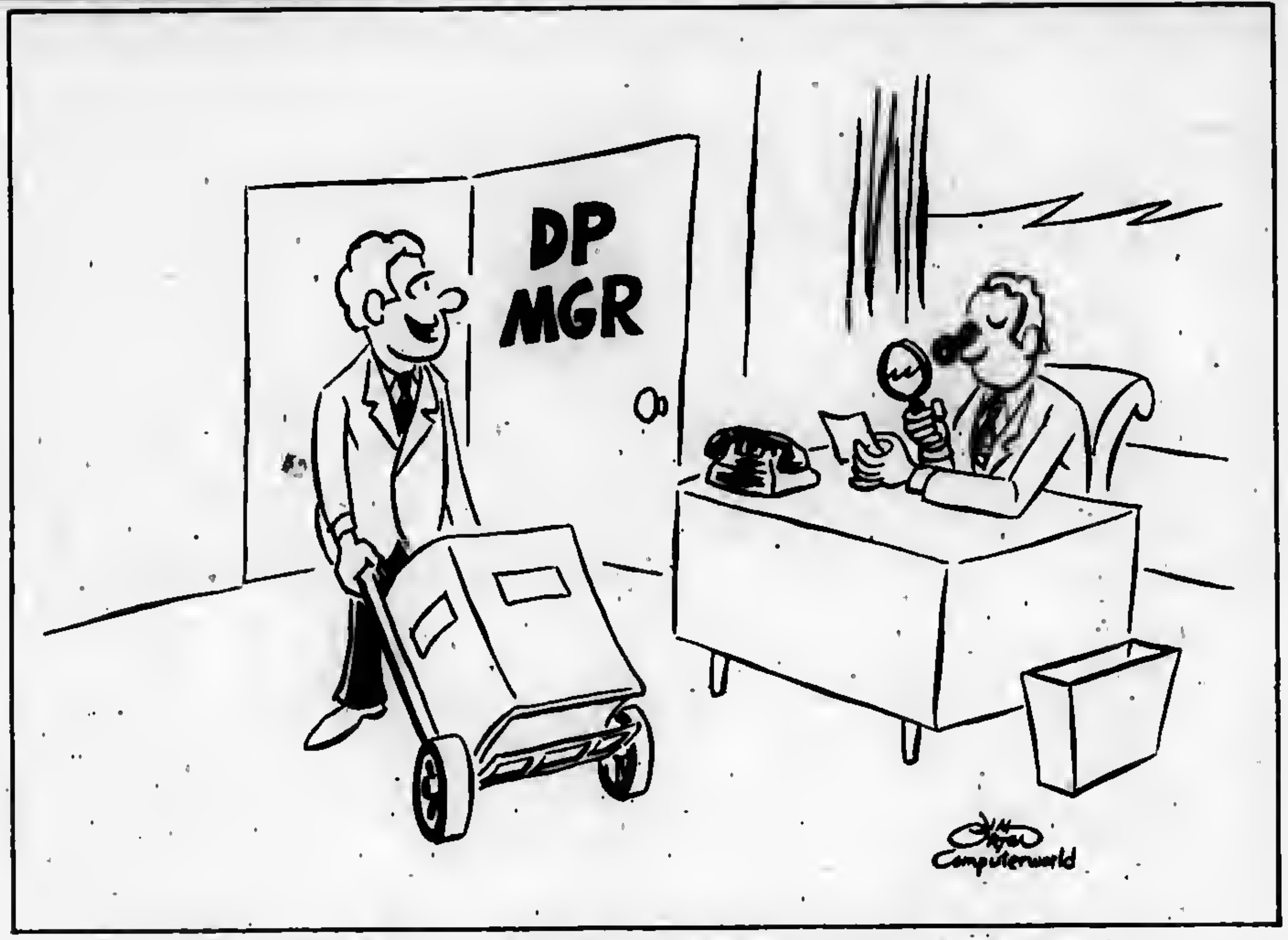
Computer Voting Comes of Age

Apparently, there were few problems with computer-based vote counting systems during the recent national elections [CW, Nov. 8], indicating this form of ballot tabulating has finally matured into a useful technology.

During earlier elections, problems that plagued the systems – from wet cards that could not be read to "mysterious holes" in the cards – made people distrust the systems and gave the entire computer field a black eye.

But this year's smooth show should put some of those worries to rest, although constant vigilance is needed to make sure the systems work as advertised.

But for this go-round, everyone involved in making, programming and operating the automated voting systems deserves congratulations.



'There's Not Much to the Code, But Wait'll You See the Test Plan.'

Letters to the Editor

No Quarrel With Substance, But Title Lacks Objectivity

Although I find no quarrel with the substance of "Contracting With IBM May Be Cheaper in Short Run" [CW, Nov. 1], I do wish to comment on the lack of professional objectivity in the selection of its title. To illustrate, the article could have been titled "Contracting With Itel May Be Cheaper in the Medium to Long Run."

This article implied it would probably be customary for a computer user to change his CPU every two to three years. I believe careful research will substantiate the fact that more and more users are retaining CPUs for at least three years. This is especially true in the public sector.

As a recent purchaser of an Itel Corp. AS/5-3 computer, Miami-Dade Community College underwent a thorough investigation of price/performance, life expectancies and residual values before making the Itel decision.

Phil Nicely
Dean of Systems, Planning and Research
Miami-Dade Community College
Miami, Fla.

Data Past

Five Years Ago
Nov. 17, 1971

NEW YORK – Univac introduced its medium-scale disk-oriented 9700, stressing IBM compatibility and a high price/performance ratio. The largest member of the 9000 family, the 9700 was described as offering users performance three to five times more powerful than the 9400 (previously the largest 9000 series model) and more than twice that of the IBM 360/50 at prices below those of the 370/145 for long-term leased and purchased systems.

– – –

LAS VEGAS – A study released at the Fall Joint Computer Conference revealed over half of the public felt people were too dependent on computers and computers have eliminated more jobs than they created. The study was cosponsored by the American Federation of Information Processing Societies, the conference sponsor, and *Time* magazine.

Eight Years Ago
Nov. 13, 1968

WASHINGTON, D.C. – The Federal Communications Commission (FCC) granted AT&T's request to delay the implementation of tariffs permitting the attachment of customer-owned devices to the public telephone system from Nov. 1 to Jan. 1. The FCC said the delay was granted to allow more time to consider AT&T revisions to the proposed tariffs it filed with the FCC in September 1968.

– – –

ATLANTIC CITY, N.J. – A joint Share/Guide Cobol Project group delivered a formal protest to IBM opposing the company's plan to phase out compiler and object program support for Cobol F on the IBM 360. The action was in marked contrast to the group's passive response a year earlier, when IBM announced it was restricting its support of its Cobol and Fortran compilers.

Assumptions Lack Support

James H. Conole's article, "Contracting With IBM May Be Cheaper In Short Run," purported to show "hidden costs" could make a non-IBM system lose its price/performance advantage over the IBM equivalent.

Throughout his analysis, Conole made assumptions concerning the value of 158s and 168s when shipment of the next IBM generation begins, the list price of the Itel Corp. AS/5, the cost of capital to purchase the system, the residual value of the Itel equipment and the total cost to the user purchasing a system.

Conole chose to prove his argument with Itel AS/5 prices, which haven't even been released yet. Why didn't he use the cost of an Amdahl Corp. 470V/6 in comparison with a 370/168? After all, the price of the Amdahl has been published and systems have been installed.

Conole stated his analysis keyed on assumptions of the residual worth of the computers and he seemed to be counting on a "quantum drop" in value of all computer systems when the next generation of IBM systems is shipped.

In any analysis, the number and significance of assumptions should be kept to a minimum. Until more of the facts can be ascertained, I would say the conclusions of this analysis are highly debatable.

Russell Thorstenberg Jr.
Houston, Texas

Sad to See Him Go

I would like to express my dismay at the discontinuance of Herb Grosch's "Black Hat/White Hat" column. I must say that I have shared the misgivings of other readers about Herb's insistence on becoming personally involved in many of his stories.

However, much of the time Herb's pieces were worth reading not only because of what he said – witness the perceptive reports dealing with the foreign computer scene – but also because of how he said it.

Gerard Salton
Ithaca, N.Y.

Production Control Works Better

Software Physics' Value Small in DP Management

Reader Commentary

By Melvin J. Strauss

Special to Computerworld

Much has been written lately about software physics – that it provides better insight into, perhaps even a definition of, the DP capacity management function.

We at Chase Manhattan Bank do not believe this to be the case.

While it is true that software physics has done much to publicize the concept of vector analysis of computer utilization, it is of minimal value in data center management – its scope is too narrow and its powers are primarily limited to describing (or forecasting future) system utilization as a multivariable vector (Kiviat graph) or as a composite (software work).

Its method of articulating is not conducive to communication with senior, often non-DP managers. They are concerned with the economic and financial aspects of operating a business and have little time or desire to learn to communicate with us in our jargon.

Management expects us to maintain strong control over our segment of the production process and to communicate our problems quickly and in language it can immediately understand and to which it can relate.

Software physics fails to recognize that control over a data center encompasses three factors: management of demand, management of capacity and management of the perception of performance.

These categories are generic to any production process, not just DP. Hence, no special allegories to natural physics are required for DP – they are not required elsewhere.

More and more each year, DP professionals have been recognizing the need for tools to address data center control problems, but they have been frustrated by lack of agreement on terms, difficulties in applying established industrial engineering techniques used for the last 50 years in other types of production processes and by communications problems with non-DP management.

Prior to software physics, this phenomenon gave rise to the development of hardware and software monitors, simulators and various accounting packages. Each of these has its place but, because of their combined limited scope, none solves the basic problems.

Management of demand addresses the quantification and control of user requests. Software physics attempts to address one of these topics, quantification. It imposes uniform structure in various resource needs – CPU, core, tape, etc.

This structure provides a useful vehicle for estimating increased resource requirements as a result of volume increases and new applications, but is not applicable to day-to-day operations. Computer operators complain to their managers about shortages of tape drives, disk drives and printers, but rarely do they become concerned about the number of EXCPs they process.

Similar statements can be made regarding CPU and core requirements. Operators rarely believe they have processed an excessive number of bytes, but they recognize when they do not have sufficient core.

Data center loading, then, should be expressed in terms of those things operations must allocate or reserve for an application. This is the only structure to which operating staffs can relate.

The difference between this philosophy and software physics is marked. Consider the on-line job which alone accounts for 50% of the allocation of all disk drives but only 5% of all disk-related EXCPs or "disk work." Is this job responsible for major or only minor disk demand?

Software physics would calculate this as a minor percent of all disk work. Most managers would consider it major.

Furthermore, software physics relates only to quantifying utilization. It does not address the much more critical issue of control.

Management of demand, at least in every other processing industry, requires understanding and controlling the difference between utilization and demand. Software physics does not directly recognize this difference.

Demand, in DP, can be exemplified by requests by some user, for example, for 25% CPU between 3 a.m. and 4 a.m. Utilization relates to actually running the job, for example, 30% CPU between 3:30 and 4:30 last night.

Management by Default

When utilization closely approximates demand, management of demand occurs by default. But this approximation rarely occurs in most shops. Usually jobs start and finish late, take widely varying amounts of resources and run more frequently than expected.

This results in accusations by users, often unjustified, that DP service is poor and is reflected in the inability of operations managers to state how they plan to service particular jobs.

These problems have been solved outside software physics. At Chase, each application (consisting of several jobs) is covered by a service agreement between computer operations and the appropriate user area. The service agreement, or contract, is a very simple (but detailed) tool which documents specific user commitments to provide timely, error-free input; specific computer operations commitments to meet stated user deadlines; and, where appropriate, specific resource requirements of individual jobs and the associated expected in-

(Continued on Page 22)

Consider Chrysler Corp.'s Process

Would You Make a Good Tester of Test Systems?

The Taylor Report

By

Alan Taylor, CDP

The question of how computers and programs are tested got a new twist this year which may bring more understanding about the current lack of precision testing of programs in our DP shops.

These tests were designed by people who manufacture test systems and diagnostic equipment down in Huntsville, Ala., where the commercial art of testing has a long history.

Let's take a look at what they came up with when Chrysler Corp. wanted to test the computers and programs that would in turn test lean burn engines in a mass production environment.

The product being tested is a Spark Advance computer which is made up of some 200 functioning parts including subassemblies of programs. The solid-state parts are applied to the subassemblies before everything is joined with a vacuum transducer into a single unit near the end of the production line.

Testing During Assembly

During the assembly operation there are three tests. The first test sequence is simply a check on whether the circuit boards have been properly connected to the capacitors, connectors, etc. and whether the board itself meets specifications. The test is computer-controlled both for the purpose of spotting problems and for describing them to the repair areas.

The second test is a 185°F environmental test in which the program subassemblies are checked out before being potted in blue silicone compound. After this test, the whole is melded into a unit and the newly assembled computer is ready for the final computerized checkout (but not the final test – that comes later).

In the whole-computer test, the lean burn engine's performance, speed and other characteristics which are sensed by the computer are simulated; a computer prints the test results on a video screen, including diagnostic suggestions relating to failure ideas.

When this test is over, there is still another one at 185° before the computers are labeled and prepared for shipment to the assembly plants.

After this, many people would think the testing was completed. Chrysler, however, does not think so. The finally approved computers are now brought into audit and 10 of them are rechecked for proper operation.

Audit – not testing – provides the final quality control rating of the outgoing product.

This testing regime is necessary in order to have tough quality control standards for the electronic lean burn engine because of the critical role of the computer in matching the government's emission standards, according to Arthur E. Douyard, general manager of the Huntsville Electronics Division. The success of the system in permitting cars to operate without catalytic converters, using either leaded or unleaded fuel, is its raison d'etre, and failure to catch cases where this is not successful could be serious.

Questions Raised

So much for the mechanics of the testing system, which is certainly an intricate one. Most of us, however, are not going into mass production of even program subassemblies.

What can be learned from the Chrysler operation? Are the tests unnecessary? Would it be possible to do without the first or second environmental test, for example?

Are the programs adequately tested in the simulation process? Indeed, are they tested at all? What is the testing really showing – that a program will match up with the requirements of the federal emission standards when the car is new? Or that it will continue to operate properly for some years?

All these questions are pertinent if we are to understand and profit from the advantages and problems of the testing system.

But these must wait at the moment. The system of testing and the system of the actual operation of the computer programs is sufficiently unusual that the accompanying diagrams may give a much better description than any words can.

Take a look at them – and consider for yourself whether the testing is inadequate or overadequate and what results at various levels would either justify or change the levels of testing.

Then consider whether you are carrying out the principles you are instinctively adopting.

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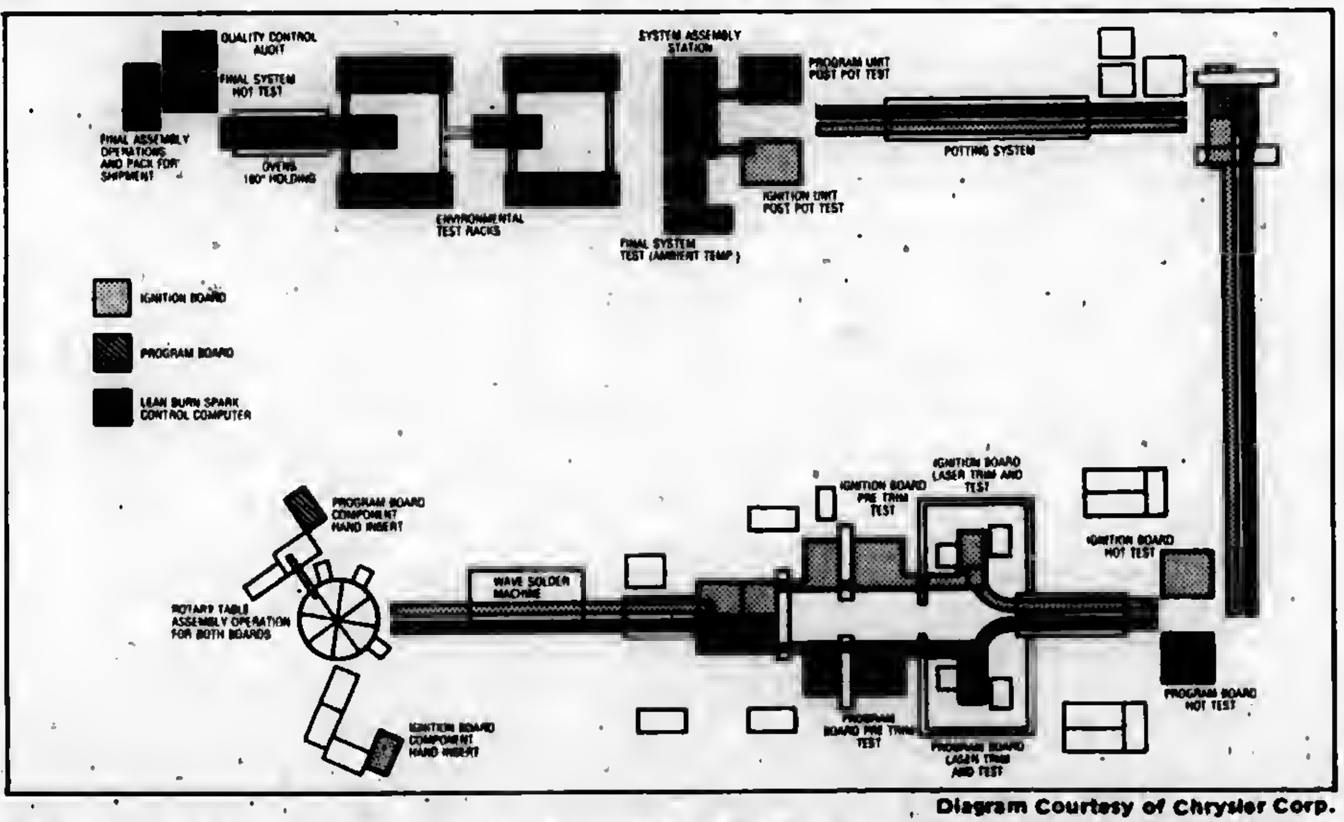
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IGNITION BOARD LASER TRIM AND TEST
PROGRAM BOARD PRE TRIM TEST
PROGRAM BOARD LASER TRIM AND TEST
IGNITION BOARD HOT TEST
PROGRAM BOARD HOT TEST

Diagram Courtesy of Chrysler Corp.

This test system segment is used to test programs as well as hardware. It is part of the Huntsville, Ala., operation of Chrysler Corp.

Software Physics Has Small Value in Data Center

(Continued from Page 21)

put volumes.

User violations of input timeliness, quality or volume release computer operations from absolute responsibility to meet the contracted output deadlines. Demand is then processed on a "best efforts" basis.

This procedure forces the user to provide better service to DP operations. He must structure his data preparation operation more carefully and is forced to recognize precisely who is responsible for late computer output.

The signatures of key senior members of both DP and user management on the contract ensures each party will abide by the contract.

Management of Capacity

Management of capacity involves more than just striving for colining circles on a Kiviat graph or balancing EXCP traffic across channels. When production costs are taken into account, it encompasses manual support of computer processing and demand constraints more than hardware load balancing.

System monitors, simulators, and equations that liken Newton's Third Law to the output of an IBM 3 are all valuable and have their place in our repertoire of tools, but they do not identify many of a shop's major operating constraints and, therefore, their exclusive use would not focus on the real problems.

We presented a description of these constraints in *Computerworld* nearly two years ago. To summarize, constraints upon capacity usage fall into two categories: those that are a function of demand and those related to operational ineffectiveness.

Demand constraints result from applications being different sizes. A mix of jobs may saturate one component such as tape drives, but not all CPU cycles will bc required. Keeping output deadlines in mind, if all other applications waiting to be run use a tape, the remaining CPU cycles are unusable.

Application interdependencies amplify this effect. Operational effectiveness constraints include system downtime, data problems and operator errors.

By keeping records of the occurrences of these constraints, one can simulate the effect on output timeliness and quantify service risk as a function of computer loading. Restated, it is possible to guarantee 90% timeliness 95% of the time by planning to load a system no more than, say, 62% of capacity.

We at Chase are completing our third year of commitment to this methodology by signing yearly performance contracts with our senior management as well as contracts with our users.

Software physics does not provide this technology.

Importance of Communication

The perception by senior management of a data center's performance can be only as good as the data center's ability to communicate with that group. One cannot expect many corporate heads to appreciate a 10% increase in "software work" when users complain of poor service.

Nor do they understand altering bytes. It sounds more like something a dentist does, not a data center. Moreover, bytes are not directly identifiable with major corporate processes or products.

Communications with senior managers must be on their terms. Once the capacity level-service risk concept is understood, performance should be reported to them in terms of service maintained, demand as a percent of capacity, effectiveness and unit production cost.

These factors – demand management, capacity management, and performance perception – are key. I have not discussed costing and its relationship to the demand-utilization issue. I have not discussed how additions to SMF-type data reduction can help an operation identify and then quantify its effectiveness problems.

And I have not discussed how simple reliability calculations can improve user service by reducing equipment and costs. These are all basic production control techniques already used in other industries.

It was once forecast that DP professionals would inherit corporate leadership; it is painfully obvious this is not happening. Perhaps our problem is that we are speaking the wrong language, promoting the wrong things.

Our failure is one of scope and articulation. Software physics will not address this issue. Production control already has.

Strauss is a second vice-president and manager of Chase Manhattan Bank's Computer Production Planning and Measurement Department in New York City.

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- **22** Director/Manager/Supervisor DP
- **23** Systems Manager/Systems Analyst
- **31** Manager/Supervisor Programming
- **32** Programmer/Methods Analyst
- **41** Application Engineer
- **42** Other Engineering
- **51** Mfg Sales Representative
- **52** Other Sales/Marketing
- **60** Consultant
- **70** Lawyer/Accountant
- **80** Librarian/Educator/Student
- **90** Other: ________________

Detach here, fold, and place in post-paid envelope attached through binding.

With No Meaning to Management

Software Physics Not Relevant Outside DP World

By Vincent J. Bannan

Special to Computerworld

Michael F. Morris' recent challenge concerning software physics [CW, Oct. 18] went one step further in adding to my confusion on this subject.

I really don't know why I should be confused because I have been associated with mathematical statistics, physics and computer performance for many years. But I continue to be turned off by this whole quest for the Holy Grail.

I guess the best way to express my feelings is to imagine the same kind of controversy swirling around a small trucking and freight dispatching firm. Sometimes I think of computer operations in this analogy:

The company has five large tractor trailers. The firm's operations manager is constantly under stress — how to give service to his customers? How to keep costs down? How to meet shipping requirements? Rating problems.

The president of the company continues to ask him, "What is the capacity of our five trucks?"

"What do you mean?" the manager asks.

"Well, will we be able to meet deliveries in six months or a year, or do we need to buy another truck or different trucks?" the president replies.

The manager tries to find the answer. He goes to meetings where he commiserates with other managers of small trucking companies who also have this problem. Together they talk a lot, drink a lot and learn very little.

Suddenly, he reads in a trade journal about a new theory that is going to solve his problems. What it seems to be able to do is to tell him how to calculate the horsepower rating of his trucks.

It will tell him how trucking power can be calculated as a vector quantity so he will know what the maximum speed a truck can travel with a given load, on a given highway, at a 20% grade.

If he examines a given shipping requirement by weighing it and measuring it and calculating the distance from his warehouse to the point of destination, he can figure out its vector demand.

This sounds very scientific except that the real problems facing the operations manager are that he cannot run his trucks all of the time, they can't go in all directions and other restraints are much more overpowering than the horsepower ratings of the motors.

Management wants same-day delivery. Because of time requirements, shipments must go with less than truckload quantity. Speed limits prohibit maximum speed, which contributes to his problems. Safety regulations add to it.

Moreover, demand is not evenly spread over the 30 days of the month. The peaks in the first four or five days aggravate his production plans.

Somehow knowing the horsepower rating of his trucks doesn't seem relevant.

'Oh, That. It Figures Out the Change.'

With this analogy, I am certainly exaggerating and oversimplifying in some respects. My point is that, when the president of the trucking company asks about the capacity of the trucks, he is really asking about their capacity to serve his company's demands, not their capacity to transport things in abstract.

The president of a company who asks about the capacity of his computer is really asking about its capacity to do required production tasks like payroll, accounts receivable or sales statistics within the accepted policy and time restraints. To answer him in terms of the capacity of the machine to transfer bits or to change and replace them or to provide units of software work is not relevant to the question at hand.

When a policy is made that the orders received today are to be invoiced today, how does one reflect that in terms of software work?

Even a casual reader knows it may require more capacity to do that than to allow invoices to be produced in a catch-as-catch-can manner. When management of a bank demands that checks get to the clearinghouse by certain times, these requirements tax the capacity of the computer; in terms of software work, however, they have not changed the vector quantities. One must begin looking at the concatenation of these vector quantities on a detailed time axis.

Reader Commentary

These remarks are not meant to reflect negatively on the good positive analysis that software physics is researching. They are only my reaction and echo the reaction of many people in the industry with whom I have discussed this topic.

I just don't understand the relevance of software physics outside the technician's world. It might be a vehicle of communication among technicians, but I miss its meaning to management.

Until we address these kinds of problems, I think we are being unnecessarily precise in answering a question that very few people have.

Bannan is president of Value Computing, Inc.

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Software Industry's Viability Not in Question Today

By John R. Bennett
Special to Computerworld

We at Applied Data Research, Inc. (ADR) read with interest "IBM Couldn't Pinpoint Software Industry's Vitality" and "Software Predictions Off?" [CW, Sept. 27].

These stories covered IBM's 1970 estimate of the viability and potential of the software industry as well as its evaluation of five software companies (ADR, Computer Sciences Corp., Computer Applications, Inc., Computer Usage Co. and Computing and Software, Inc.).

Many of the points covered in *Computerworld's* review of the IBM report were certainly perceptive and accurate: Since 1970, many software companies have not survived; the unbundling announcement did not bring about an immediate bonanza for software companies; many software companies were not marketing-oriented; software products had heavy initial investment and long-term payouts, many companies lacked experienced management; and the need for a manufacturers documentation did necessitate a delay before others could develop a complementary or competitive product.

IBM was eventually proven wrong in the one all important area – the autobuying syndrome. This was its belief that there would be a tendency to buy software from one source, such as the mainframe manufacturers.

Today, when there is the opportunity for users to compare two software products competitively – one from an independent software company and one from a computer manufacturer (i.e. IBM) – the independents are winning more often.

These gains in the marketplace are a result of the overall quality of the independents' software products including their facilities, efficiency, documentation, reliability and support.

Datapro supported that conclusion in its 1975 report on IBM vs. non-IBM software products. The report found that in the overall categories of satisfaction, throughput/efficiency, ease of installation, ease of use, documentation and vendor support, independent software companies' products were rated significantly higher than IBM's products.

Reader Commentary

The IBM report did not state many software companies are financially motivated to produce the best software possible. Today, software companies are attracting some of the best people in the industry; they are doing a superb job of marketing and supporting their products; and, finally, they are becoming specialists, which makes them formidable competitors of IBM.

This competition is good for the user – such competition has stimulated rapid innovation in software product technology.

As for ADR, the report said its 1970 product line was limited. And it was at that time. But today ADR has seven systems software products as well as a line of hardware/software products for the telephone industry.

ADR has increased its software product revenues since 1970 by over 350%. ADR has accumulated software product sales well over $40 million and grosses almost $10 million in annual software product sales.

ADR has a strong and stable technical and field marketing force and has over 5,000 products installed. We do business in over 30 countries and have very handsome profits from our software product sales.

But ADR is but one of many companies in the software products industry which has grown since 1970 and expects to have a healthy continued growth in forthcoming years. IBM may have been right in 1970 when it questioned whether a software industry was viable at that time; however, there is no question today concerning the industry's viability.

This is evidenced by the fact that software product companies will reach sales of $1 billion in the near future and that users are becoming more appreciative of the value of independent software companies and of their contribution to the development of quality software products.

Bennett is president of ADR.

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One of First 'Easyspace' Users

Chemical Maker Finds Three Benefits With Package

PHILLIPSBURG, N.J. – What user wouldn't want to increase multiprogramming, reduce disk mounting and swapping and reduce computer work area requirements by one-third?

That's what the J.T. Baker Chemical Co. here did after it became one of the first users to acquire the Easyspace software program from Value Computing, Inc.

A manufacturer and distributor of chemical products for industrial and laboratory use, J.T. Baker maintains an Information Services Department staffed with 20 people. Its computer configuration consists of an IBM 370/125 with 256K and four 3330s.

Conventionally, the department runs four partitions – one on-line, one power VS and two batch. The gamut of jobs assigned to the department includes order processing, order releasing, product planning and scheduling, sales and marketing support and all general accounting functions with the exception of payroll.

"Searching for better ways to enhance the effectiveness of your capability is a continuous responsibility," according to Paul Zaboy, supervisor of technical services and computer operations. "It was this search that led us to install Easyspace.

"We were experiencing the familiar problem of setting up jobs in multiple partitions and were locked into a situation where the jobstream had to be allocated to one partition," he recalled. "We figured there had to be a better and more cost-effective way."

Designed for use in an IBM DOS/VS environment on a 370, Easyspace allows runtime allocation of scratch disk work space from a pool of available space. It was also designed to afford increased multiprogramming, reduction of disk mounting and swapping, simplification of JCL requirements, reduction of hardware requirements and the ability to change from one direct access device type to another, Zaboy said.

"The program gives us a pool of available work space we did not have before," he continued. "And it gives us better control of work space so we can maximize our use of space.

Space Requirements Cut

"The result is that we have cut our work space requirements by one-third while we have significantly increased our throughput. Instead of dedicating the jobstream to just one partition, as we had to do before, we can now allocate it to any partition. This is the kind of flexibility that translates into real production gains."

Before installing Easyspace, the Information Services Department had to plan and allocate work space in advance in order to avoid scheduling problems and the kind of overlap that can shut down the computer. Now two or more jobs no longer attempt to use the same work space.

Since Easyspace makes the scratch disk files partition-unique, conflicting assignments are automatically eliminated.

"The important thing is that we have improved the performance of our computer and its ability to effectively carry out the tasks assigned to it," Zaboy concluded. "And we have gained this additional effectiveness without making any changes in our operating system environment."

'Autoref' Cross-References Cobol Relationships

SANTA CLARA, Calif. – The Autoref package from Siegal Associates was designed to help IBM or Burroughs users understand how their existing Cobol software "fits together" and perhaps how the fit could be improved, the vendor said.

Operating in nonvirtual IBM environments or with Burroughs medium-sized CPUs, the package uses Cobol source statement libraries as input. From these, it generates a series of cross-reference reports showing the relationships between the user's source programs and copied members, called subroutines and referenced data names.

Cross-reference listings are often supplied with Cobol compilers, but Autoref goes further by listing the interrelationships between programs and even between systems, Siegal said.

With such a broad view, users can evaluate the potential of a change in a data field, for example, before making the change, a spokesman added.

Parameter cards tailor each run to the user's immediate needs. In one instance, the field of interest might be federal withholding tax while in the next run the focus could be on gross profits, the company suggested.

In cases where the same basic data name is used for more than one purpose, the control card may be used to qualify which field is of interest by defining which files it comes from, Siegal noted.

The package needs "something like 64K" bytes of memory. Users should specify which version – IBM DOS or OS or Burroughs – is required, Siegal said.

A 99-year license for use of the package is $3,000, but monthly payment plans are also available, the vendor said from Suite 112, 3000 Scott Blvd., Santa Clara, Calif. 95050.

'Jars' Gets CICS/VS Interface

McLEAN, Va. – A CICS/VS Accounting Interface Option, recently announced by Johnson Systems, Inc. for use with its Job Accounting Report Systems (Jars), is said to "significantly enhance" a user's performance analysis capabilities.

Designed to meet the accounting and billing requirements of a DP manager, the Jars add-on uses no CICS exits, needs no CICS source code modifications and does not require an installation to have IBM's CICS/VS Performance Analyzer II package, Johnson claimed.

The Johnson option provides "a majority of the data elements" of IBM's Performance Analyzer as well as some additional data from within CICS not available through the IBM package. A unique feature of the interface, the vendor claimed, is its ability to provide CPU time segregated by application program and CICS overhead.

The data taken from inside CICS and not available through IBM's analytical tools includes total Data Language/One (DL/1) counts for each transaction by type of call; accounting data by application program and file as well as by transaction; and additional tagging data such as the use of the complete name fields for accounting purposes, Johnson said.

The CICS/VS interface permits the use of basic time interval or transaction count logging options. In basic mode, every transaction is logged.

In time interval mode, data is logged at the end of each T minutes, with T a user-defined number. In transaction count mode, on the other hand, data is logged each N transactions, regardless of time involved.

Since mode and frequency parameters can be dynamically changed, users can tune their monitoring, and their analysis.

The Jars package costs $4,000 (DOS/VS) or $6,000 (OS/VS) while the CICS/VS Interface option adds an additional $3,000 (DOS/VS) or $4,000 (OS/VS). Johnson is at 8400 Westpark Drive, McLean, Va. 22101.

NCR Enhances 'Scholars' System

DAYTON, Ohio – Data bases created under NCR's Scholars student record programs will be accessible through terminals attached to an 8200 minicomputer with an inquiry/data entry module just announced by NCR.

Scholars includes five separate but complementary applications which use common data entry routines and draw on a single data base. Originally designed for use on Century mainframes, they were made available to 8200 users under Century 101 simulation, but operations were still in batch mode.

The on-line module operates under NCR's Interactive Multiprogramming Operating System (Imos) and allows as many as seven CRT terminals to be attached to an 8200 to enter and access data, a spokesman noted.

The minimum configuration needed for the Scholars 8200 system is a 48K processor, a CRT terminal, two disk units, a line printer and a card reader.

The entire Scholars system, including the on-line module when it becomes available in the first quarter of 1977, will cost $850 plus a monthly license fee of $120. The combined fees for Century 101 simulation and Imos add another $25 to the monthly cost, NCR noted.

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Because Paragraphs Cost Time

Structured Programmers Should Build on Sections

By Stephen E. Wright

Special to Computerworld

Concepts and Techniques

Many teachers of structured programming in Cobol as it exists today recommend the compulsory use of EXIT paragraphs and of the THRU option of the PERFORM verb.

This leads to extra work on the part of the programmer. More important, it reduces the readability of the program, both by the duplication of names in the PERFORM and by the proliferation of superfluous paragraph names.

Fortunately, an alternative exists in the use of sections, rather than paragraphs, as the basic building blocks (modules) of structured programs.

If this approach is adopted, several important improvements in readability result:

- The PERFORM verb is always used without the THRU option. The statement:

```
PERFORM   GET-NEXT-TRANSACTION
  THRU
 GET-NEXT-TRANSACTION-EXIT
```

is not only more awkward than:

```
 PERFORM GET-NEXT-TRANSACTION
```

but even further away from the presumed intent of the programmer, which is an ad hoc COBOL "verb":

- Since paragraphs within a section are implicitly qualified by the section name, they need not be unique across sections. As a result, short, meaningless paragraph names can be used as the destinations of local GOs for such things as looping, exit to the end of the section or any other local transfers required by the current absence of true structured programming constructs in COBOL.

The use of short, meaningless names for local *points* in the text enhances the effect of meaningful names for *processes* represented by sections. For example:

```
GET-NEXT-TRANSACTION SECTION.
A.
  PERFORM READ-TRANSACTION
  IF NO-MORE-TRANSACTIONS
    GO TO X
  ELSE
    IF TRANSACTION-COOE NOT = 'T'
     PERFORM PRINT-ERROR
      GO TO A.
  PERFORM PRINT-TRANSACTION.
X. EXIT.
```

While there are limitations to this approach (for example, in declarative sections), it offers more readable structured programs for those users who have no access to more powerful techniques, such as the use of preprocessors.

Wright was one of the founders of and is now a senior staff consultant with Applied Data Research, Inc. in Princeton, N.J.

Diversifiedata Has Package for IBM 32 Users

COLUMBIA, S.C. – The Total Business Package (TBP) from Diversifiedata Services was designed to provide users of the IBM 32 with programs for payroll, inventory control, accounts receivable, accounts payable and general ledger accounting.

The payroll processing includes all the conventional features: check writing including year-to-date totals on check stubs; accumulation of data for and preparation of 941A reports and W2 forms; generation of time sheets for the next time period; and department cost reports.

Tax calculations – for salaried or hourly employees – are normally based on federal and state withholding tables with support for "numerous" deduction codes. The program permits extra compensation to be paid in a specified period without excessive tax amounts being withheld, the vendor said.

The inventory control program supports recording of basic information and retention of demand information for 13 months. That provides both comparison of the current month to the same month a year ago and a picture of how demand has changed over the year-long period, a spokesman explained.

The accounts receivable system can be set up for open item or balance forward accounting with statements and, if desired, invoices. Service charges can be applied selectively and the program produces an "aged" list of accounts.

Writes Checks, Reports Expenses

The accounts payable portion of the package writes checks for payment of invoices and notes which invoices are covered by each check. A distribution report shows current, last week and year-to-date expenses by account number.

The general ledger supports "any size" chart of accounts and includes percentage or budget dollar comparisons on the income statement. Reports for two or more locations may be combined, the company said.

The entire TBP, including source code, documentation and installation materials, costs $5,000, the spokesman added from Suite 406, 240 Stoneridge Road, Columbia, S.C. 29210.

Three User Groups Set Meetings

User groups in Connecticut, Indiana and New York are planning meetings in the next few weeks at which presentations of the ASM2 disk space management package from Cambridge Systems of Cupertino, Calif. will be featured.

The meetings are open to any interested users, group leaders said.

The Indiana OS/VS Users Group has scheduled its meeting for Thursday, Nov. 18, at a user site in the Indianapolis area. In charge of planning the session is Rolland Chastain, Public Service of Indiana, 100 E. Main St., Plainfield, Ind. 46168.

The Hartford, Conn.-based MVT Users Group (MUG) is planning to have its gathering on Tuesday, Nov. 30. The person to contact is Fred Goff at Connecticut General Life Insurance Co. in Hartford.

In New York City, the TSO Users Group has set Thursday, Dec. 2, as its meeting date. Further details of time and place are available from Tom Torregrossa, Irving Trust Co., 40 Rector St., New York, N.Y. 10005.

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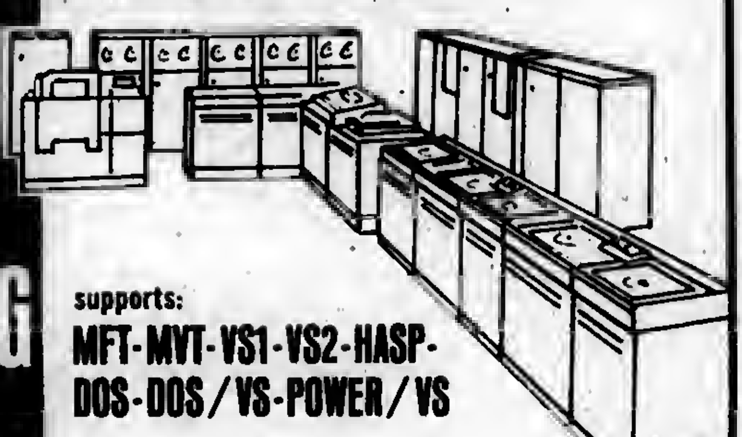

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Cosmic Retrieve/Display System Designed for Univac 1100 Sites

ATHENS, Ga. – The Marshall Information Retrieval and Display System (Mirads-2) from the Cosmic clearinghouse is said to be a versatile command-driven data management system for Univac 1100 sites under Exec 8.

Used for such diverse applications as personnel management, manpower analysis, task management and space shuttle payload planning, the system supports storing and searching, sorting, both simple and complex computations, updating and printing or displaying output, Cosmic said.

Mirads-2 was designed for use by non-DP-oriented personnel; the commands offer the user flexibility in applying them to data management tasks, a spokesman added.

Familiarity with the commands can be gained in a period of a few hours, he claimed.

Data files under Mirads-2 may be structured to eight levels of subordination and each level may have as many as 10 different record types. Data security is provided at the data base file, record and field levels, the spokesman noted.

The computing capabilities include counting, summing and exponentiation as well as the four basic arithmetic operations. User-formatted output displays and reports are also part of the system, Cosmic said.

The free format user inquiry language supports multiple users of multiple files; response times of 3- to 5 sec for files of 5,000 records are possible through the use of an inverted list indexing scheme, the spokesman continued.

Written largely in Cobol and Fortran but with 15% Assembler code, Mirads-2 runs on a Univac 1108 under Exec 8 and requires 32K 36-bit words of main memory. It operates in batch mode or on-line.

Distributed on Univac Furpur-formatted tape, the system is available – as program number MFS-23510/CW – for $2,300. Documentation is available separately for $34.

Cosmic, which handles distribution of government-developed software to the general DP community, is at Suite 112, Barrow Hall, University of Georgia, Athens, Ga. 30602.

IESI Releases 'Quick' For Datacorder Users

SEATTLE – International Entry Systems, Inc. (IESI) has introduced Quick, a software package designed to help users of the company's Datacorder intelligent terminal [CW, Sept. 6] create data entry routines without programming.

With the package, the nontechnical user gains two programs: a format generator and a "combiner." The generator is used in an interactive mode, requiring input from the operator to create specification tables, an IESI spokesman explained.

The combiner then assembles a data entry program from the tables. In this last step, the operator need only type in a title and program number, he said.

The user programs can be used to create or confirm check digit calculations, validate entries on the basis of acceptable specific values or ranges or to act as a key verification routine for data just entered.

The technique supported by Quick is said to be easier for the non-DP user to manage than the "fill-in-the-blank" technique used by some other software.

Quick is available to Datacorder users for $100 to cover the cost of tape preparation and documentation, the spokesman added from 408 N.E. 72nd St., Seattle, Wash. 98115.

'Insyd' Gives 3277 Look At State of DOS/VS Systems

GREAT NECK, N.Y. – The Instantaneous System Display (Insyd) package from Labyrinth Systems, Inc. supports an IBM 3277 CRT to provide the DOS/VS systems programmer with "an immediate visual picture" of the state of the system, the vendor said.

The CRT display was designed to show the total system load and a breakdown of the resources currently in use, including the working set requirements of each program. The data is updated at a user-selected frequency; the maximum allowable interval is 9 sec, according to Labyrinth.

Insyd costs $3,000 and is available now from Labyrinth Systems, 17 Barstow Road, Great Neck, N.Y. 11022.

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Tax Service Saves Furniture Designer $7,500

ZEELAND, Mich. – The $7,500 or 700 man-hours that would have been spent in after-the-fact determination of local taxes is what John Ruster, senior systems analyst of Herman Miller, Inc., has reported his company saved in fiscal 1975 through the use of a service.

Available on a subscription basis, Salestax from Vertex Systems, Inc. of King of Prussia, Pa., is a file of current tax rates for all sales tax jurisdictions in the U.S. recorded on magnetic tape to allow application of appropriate state and local taxes to the billing amount.

The service includes monthly updates of all rate changes, thereby eliminating sales tax rate maintenance for the subscriber, Ruster explained.

Marketing Statistics

Herman Miller, Inc. is a designer and manufacturer of contemporary furniture whose products are marketed in the U.S. and abroad. The company is registered to do business in 41 states.

In 1975, the first year Herman Miller subscribed to Salestax, the company serviced about 22,000 customer orders using an IBM 370/135 for processing everything from order acceptance to final shipping.

"It took about 180 hours over a period of six to eight weeks to complete the entire systems and programming work required to interface the Salestax file into the current Herman Miller billing system," Ruster said.

"We now use the service in our order entry, invoicing and order revision systems and are also taking advantage of the national geographic breakdown the service provides to develop important marketing statistics. These statistics, which give us buying power by county, have already resulted in a realignment of our territories and the establishment of new regions, he said.

"We expect in the near future to attempt various forecastings based on U.S. government statistics available on the furniture business, including buying power indexes and projections of population growth," he added.

"With the geographical code structure Salestax provides, we are able not only to retrieve current sales tax rates at state, county and local levels for application to the billing amount, but also to summarize automatically by geographical location. This summarization can then be automatically interfaced to our general ledger system to record our sales tax liability.

"The printouts we produce through this process become the source for our entries on state tax reporting forms," Ruster said.

Previous Exposure

Roy Keech, Herman Miller vice-president of finance, also expressed satisfaction with the service, which "gives us the capability of meeting our tax compliance obligations in a more efficient and expeditious manner.

"Previously, our inability to easily determine local tax rates made the recovery of local taxes burdensome, causing substantial exposure to Herman Miller," Keech recalled.

James Von Ins, assistant secretary and treasurer, voiced still another reaction. "Tax assessments," he said, "can be substantial. Failure to bill the full amount of sales tax in one state alone where we are registered can mean an assessment of tens of thousands of dollars in a single year. Salestax gives us the required information to completely eliminate this exposure."

Compiler Free To GRI 99 Users

NEWTON, Mass. – An RPG-II compiler which is said to permit terminal operators linked to the company's System 99 business computer to interact with running RPG programs is now available from GRI Computer Corp.

Used in conjunction with the GRI RPG-II source editor and interactive execution Control Language, this interactive terminal support means users can sit at a CRT terminal, enter RPG-II source statements, edit the code, compile, link, execute the program and interact with it in real-time without any punched card input, a spokesman explained.

As many as four terminals can be supported remotely by a single System 99; user activities are "fully multiprogrammed" so a range of functions can be performed concurrently, the company added.

The compiler is available free to System 99 users, GRI said from 320 Needham St., Newton, Mass. 02164.

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There are a host of reasons why. But quite simply it comes down to this: **SHADOW II** requires less hardware than even the least sophisticated of its competitors — yet offers more flexibility, more facilities and more power than the largest and most complex of them, including its unique multi-tasking capability.

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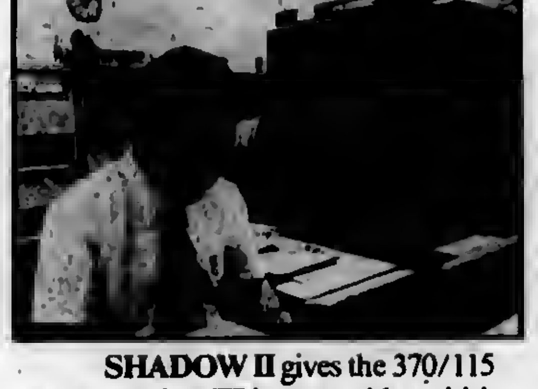
Mr. John Pezzullo, Director of Information Systems for the hospital, recently replaced a CICS/VS system with SHADOW II integrated to IDMS.

The hospital has a 384 K 370/135. After converting to SHADOW II their TP partition size was reduced from 1140 K to 375 K. Response times were dramatically improved — approximately cut in half.

With the new system, an additional one and sometimes two batch partitions can be run concurrently with the on-line system without affecting performance significantly.



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Use of Cobol Coding Margins Avoids Need to Switch to PL/I

By M. Curtis Stordahl

Special to Computerworld

Concepts and Techniques

Top-down structured coding has been the normal technique for goal directed programming (GDP). PL/I is one of the few languages readily adaptable to top-down work, but many DP departments are not ready to jump to a new language – new for their installations – just to use this technique.

And they don't have to make such a switch because top-down programming is not the only method for achieving GDP.

In GDP, we need the ability to group statements to define individual goals and implied iteration of these goals.

In PL/I, we can group statements into DO groups by placing the statements between a DO and an END. In PL/I, we can group statements into DO groups by placing the statements between a DO and an END. In Cobol, we can group statements into paragraphs by placing them in the B margin, following a paragraph name in the A margin.

Implied iteration in PL/I is accomplished by an IF condition THEN DO and a DO WHILE (condition). In Cobol, we can use the IF condition PERFORM paragraph-name and the PERFORM paragraph-name UNTIL condition.

Suppose we were given a top-down algorithm and were asked to code it into Cobol. First, we would identify the groups by nesting level and place them into paragraphs. Then we would substitute the DOs with PERFORMs..

Thus, if we were given the following top-down algorithm:

```
NEST
1 IF A THEN OO;
2   STATEMENT 1;
2   IF B THEN DO;
3     STATEMENT 2;
3     DO WHILE C;
4       STATEMENT 3;
4       END;
3     STATEMENT 4;
3     END;
2   STATEMENT 5;
2   END;
1 STOP;
```

This can now be transformed into the following Cobol-like code:

```
NEST-1.
  IF A THEN PERFORM NEST-2.
  STOP RUN
NEST-2
  STATEMENT 1.
  IF B THEN PERFORM NEST-3.
  STATEMENT 5.
NEST-3.
  STATEMENT 2.
  PERFORM NEST-4 UNTIL C.
  STATEMENT 4.
NEST-4.
  STATEMENT 3.
```

'Eurocomp' Papers Now in Two Volumes

LONDON – Published in two volumes, the proceedings of the European Computing Congress (Eurocomp) held here earlier this autumn [CW, Sept. 20, 27] are now available from the meeting sponsors, Online Conferences Ltd.

Reflecting the makeup of Eurocomp itself, one of the books has all the papers presented on computer performance evaluation. The other volume covers the software engineering presentations.

Because of the differences in subject matter and the possibility that individual readers might be interested in one but not both, the books are separately priced.

The firm is on Cleveland Road, Uxbridge, Middlesex UB8 2DD, England.

Mumps Guide Available

ST. LOUIS – A 12-page pocket guide to the Mumps language [CW, Sept. 13] has been prepared by and is available free from the Mumps Users' Group (MUG), according to Joan Zimmerman.

Single copies of the guide can be requested from Zimmerman, MUG, 700 South Euclid Ave., St. Louis, Mo. 63110.

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Ten Terrifying Questions
to ask a person trying to sell you
a computerized personnel/payroll system

Terrifying question number one

OK, so we're sold on using a system—who's going to install it? Are you equipped to do it? Can you get it up and running fast? Are experts on hand, who have done it before? Will you give us tender, loving care while you install our new system? Will we get good support after we're up-and-running?

Terrifying question number two

Will the system's value exceed its cost? Can you prove it? Exactly where will savings come from? How will costs be cut? Can you give us figures showing savings in time, money, and better use of our staff?

Terrifying question number three

What's your track record? How many systems are actually in operation? Do your users boast about the system? Are they happy? Will they pass on the good news? Is there any good news?

Terrifying question number four

How about documentation? Will we know exactly what we've got? Is it easy to understand? Can we take the reins quickly? We need high quality training and manuals. Will you provide these?

Terrifying question number five

How about reports for EEO, ERISA, and OSHA? Can we handle those? I mean really handle them. Can we meet compliance demands quickly and inexpensively? We'd like to relax on that score.

Terrifying question number six

Will it be a hassle every time we need information? Can our Personnel or Payroll Departments retrieve information without calling in a programmer? Can your retrieval system understand English?

Terrifying question number seven

How flexible is the system? Can we expand it as we grow? Will your people sit down and discuss our particular needs and tailor the system to them? How comprehensive is your Payroll system? What about manpower planning, salary and benefits administration? Or health and safety programs?

Terrifying question number eight

Can you provide a forum—seminars, and so forth—for our personnel, payroll, and data processing people? Can we talk to other users grappling with the same problems? In other words, can you help us keep in touch with the the industry?

Terrifying question number nine

If we can't use our computer, must we shelve the idea? Can we run the system on your computer? Do you have a systems service division to help us do our work? What other clients do they handle? What kind of turnaround can I expect?

Terrifying question number ten

Is your organization stable? Are you financially secure? Will you still be around five years from now if we must expand the system? Are you growing?

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On-Line DBMS Backs Health Care Delivery Research

Data Basics

SAN JOSE, Calif. – A research group at the Kaiser/Permanente Clinic here is investigating a systematic approach to improving health care delivery in a prepaid setting. Early in this effort, the project leader began to look for a data base management system (DBMS) that could help him.

The principal thrust of the project is to identify the health status profile of the member population, to recognize health risk factors in individual members and to perform the necessary health testing, health education and health maintenance functions to keep the overall population at the highest possible level of health.

To accomplish this, an extensive data base was developed on a sample volunteer population of 5,000 patients. Over 1,000 data elements are stored per patient, consisting of medical chart information, past medical history, psychosocial, demographic and statistical data.

Dr. Robert Harrington, principal investigator of this Department of Health, Education and Welfare-funded project, and physician-in-chief of the San Jose medical facilities, asked Con Koreneff, his project director, to organize the data so quick retrieval would be possible to support the needs of the multidisciplined research staff. This research staff consists of doctors, nurse practitioners, psychologists, health educators, biostatisticians and outside consultants, including several Ph.D. candidates who are writing their theses around the project results.

The questions asked of the data base by this mixed group of researchers may involve correlations between any two or more elements of data. Since the objective is to develop an algorithm for "treatment seeking behavior" and "risk factors," the researchers are not discounting any information as a possible predictor of criterion variable.

An on-line terminal environment is superior to batch in such an effort because it allows researchers to ask a series of questions in an interactive fashion. They are free to pursue whatever ideas occur to them on the basis of previous interactions, without having to wait out the turnaround imposed by batch processing and then trying to recall exactly why they took the last step or what they wanted to do next.

Ultimately, the Nomad DBMS on the National CSS network was selected as the best vehicle for the project. With its relational capabilities, it permits the flexibility of accessing large amounts of data from a single structure without extracting subsets of data to fit limited structures, Koreneff said.

This project has been on-going for three years and has been renewed for three more. Harrington and Koreneff feel the data management concepts developed in this project are a prototype for future health care delivery systems.

DBA Meeting Set

PHILADELPHIA – The Wharton Seminar on Data Base Administration (DBA) will be held at the University of Pennsylvania early next month, according to a Wharton spokesman.

The meeting, on Dec. 9-10, will consider the technical, organizational and economic issues facing the practicing data base administrator. One of the features will be the presentation of results of a DBA survey, he added.

The fee for the seminar is $125, he said.

More information is available from Prof. Richard Hackathorn, Dept. of Decision Sciences, Wharton School/CC, University of Pennsylvania, Philadelphia, Pa. 19174.

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Supports DOT and Education Centers

California Network Marks 'Firsts' for Bell, PT&T

By Ronald A. Frank
Of the CW Staff

SAN FRANCISCO – Pacific Telephone & Telegraph Co. (PT&T) has been operating a packet-switched digital data network for the State of California since early this year.

The transparent user network supports a variety of terminals including asynchronous and synchronous devices operated by the California Department of Transportation (DOT) and the state's system of 19 colleges and universities.

Called the Automatic Telecommunications Switching System-Data Services (ATSS–DS), the network marks several firsts for PT&T and the Bell System, according to a PT&T spokesman.

The network utilizes non-Bell switching equipment provided by Computer Transmission Corp. (Tran), which is installed and supported by PT&T.

It is the initial packet-switched service operating within the Bell System, although the Transaction Network Service (TNS), available from some Bell companies, has certain packet-type characteristics, but it does not support the broad range of terminals handled by ATSS-DS, the spokesman stated.

300 Terminals

The private line network includes 27 Tran multiplexers installed at state agency offices that are connected to the network. About 300 terminals are operating on the network including equipment from Hazeltine, Univac, Teletype Corp. and others, he indicated.

Most of the traffic is generated from asynchronous terminals to CPUs, although the net is also transparent to synchronous devices. Any two terminals on the network can transmit data to each other although most of the net is used to access CPU information from terminals operating in an interactive mode.

Terminals with traffic establish a virtual connection to transmit data on the network. When a terminal makes a "bid for service," it identifies itself with an autobaud character that includes the speed of data and the code that will be used.

After receiving an acknowledgement character from the network, the terminal operator keys in the address of the called location and data is ready to be transmitted.

Connection to the network takes less than one second, the spokesman said.

The network supports devices operating in Ascii, Ebcdic, and correspondence code. Binary Synchronous terminals are also accommodated, but only the asynchronous data is packetized on a character basis, he noted.

Three Line Levels

Three levels of lines exist. The terminal connects to a multiplexer which in turn handles multiple-terminal traffic and directs it to the nearest switch point. Traffic between switches is considered the long-haul segment of the network and this interswitch traffic is packetized.

Start and stop bits are stripped of messages and packets are assembled ranging from a few characters to about 100 characters in length. A packet is transmitted once every 100 msec forming a time slot on the net.

At present, two main switch points in Los Angeles and Sacramento, Calif. are in operation. The Sacramento switch, where the Department of Transportation DP center is located, also acts as the network control center for the system.

Most of the interswitch lines in the network operate at 4,800 bit/sec with Bell 208 data sets. There is some higher speed traffic from remote batch terminals at 9,600 bit/sec and these use Bell 209 data sets.

Terminals now on the network operate at speeds from 10 char./sec to 4,800 bit/sec and the interswitch lines may be upgraded from 9,600 bit/sec to 50k bit/sec soon, the spokesman said.

By spring 1977, the full network is scheduled to be operational and four main switch points will be interconnected with alternate routing capabilities for most parts of the system, he stated.

The full network will service five state agencies spanning 500 miles across most of California.

Current Tariff

The ATSS-DS network is operated under a tariff that includes the usual equipment charges in addition to private line intrastate rates. The current tariff is applicable to the ATSS-DS service, but the spokesman said the firm is evaluating the possibility of providing a similar service to other data users.

The present tariff makes no provision for the volume of traffic being handled on the network. Instead, a magnetic tape of traffic per site is generated at the Sacramento net control center and this data is used by state officials to allocate network charges among the various using sites.

It is expected that a similar service for business users would include another rate component based on the volume of traffic being transmitted on the network, the spokesman said.

The network makes use of portions of the Bell Dataphone Digital Service (DDS) network for interswitch links, but at present it is not an all-digital service.

Representatives of AT&T and other Bell System operating companies have visited the ATSS-DS facilities and similar services are being evaluated although no definite decisions have yet been made, the spokesman reported.

Datapoint Extends DP Functions to Phone Area

SAN ANTONIO, Texas – Datapoint Corp. has expanded and extended the functions of the terminal-based DP system into the telephone facility usage area with the introduction of Infoswitch.

Datapoint's computer-based Infoswitch is basically a Datapoint 1100 terminal system with console, CRT, typewriterlike keyboard and disk or diskette drives coupled with telephone switching equipment developed by the company, a spokeswoman said.

It is designed to interface and supplement a user's existing Centrex on PBX telephone system and controls and account's for long-distance telephone facility usage on Wats. foreign exchange (FX), tie lines or other voice communications facilities to achieve the optimum line utilization, the company claimed.

In addition to the system's dynamic routing functions, it records information on each call on either cassette- or cartridge-tape, it said.

Dual-Processor Arrangement

A dual-processor arrangement utilizes a microprocessor switching matrix with a built-in 16K program and 4K of data space, the spokeswoman noted, adding the intelligent switch is factory programmed.

It also comes with an intelligent realtime controller – a standard Datapoint CPU with 48K of internal user memory – for functions such as call logging, system monitoring and management report generation, according to Datapoint.

The system includes a standard typewriter-like keyboard, 11-key numeric keyboard, five control keys and an 80-column by 12-row CRT. It can also support a printer for hard-copy output of system utilization data, the spokeswoman said.

Communications Controller

The communications controller is microprogrammed to act as a dedicated manager for all details of call placement including a caller identity number, the phone number dialed, time of day, date and the type and duration of the call.

The controller can also offer uninterrupted long-distance service in the event of CPU or other system failure, according to the firm.

The storage media include diskette drives capable of 250K-byte storage each and cartridge disk systems that each store 5M bytes of data, according to the spokeswoman.

Two diskette drives or one cartridge drive system come with basic Infoswitch systems which can be upgraded to four diskette drives or two cartridge-drive systems for maximum storage of 1M and 10M bytes, respectively, she added.

In operation, the caller enters an identity number and dials the long-distance number. The identity number is checked by the system for the associated employee-usage privileges.

When all of the applicable fixed cost lines are busy, Infoswitch can hold the call until a facility is free or, if the caller identity number permits, use the direct-distance dial (DDD) lines after a warning tone has signaled the more expensive line utilization, the company claimed.

Features in addition to transaction identification information include speed numbers for regularly dialed numbers, multistage call holding and remote access functions, Datapoint said.

The basic six-trunk Infoswitch/6 comes with two diskettes with controller, keyboard and display, switching controller and matrix, CPU, tone receiver, termination cabling and the Infoswitch software package for $35,000, the company said.

The same Infoswitch/6 with cartridge disk instead of diskettes costs $46,900 and leases of one to five years are available, according to the spokeswoman.

There is a monthly maintenance and a one-time installation charge for each type of system, she added.

A line of peripherals for Infoswitch is available from the company including a printer, tape transports, remote data collection interface, remote communications link, tone digit receivers and backup power supplies, Datapoint said.

Deliveries of Infoswitch will begin in the first quarter of 1977, the firm said from 9725 Datapoint Drive, San Antonio, Texas 78284.

Correction

National Semiconductor Corp.'s Corporate Data Center is presently using the MVT Wylbur software originally developed by Stanford University, not Optimum Systems, Inc. (OSI) Wylbur, [CW, Oct. 25].

In the near future, the center will change over to software called MVS Mentext from Mentel, Inc. of Palo Alto, Calif., which has a command structure which looks like Stanford's Wylbur.

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Terminal Transactions

Hospitals' Terminals Aid Heart Patients Recovery

By John P. Hebert
Of the CW Staff

NEW YORK – Computer terminals in the intensive care units (ICU) of the Mt. Sinai Hospital here and another facility in Texas are reportediy helping to reduce the incidence of unexpected, life-threatening events for heart surgery patients.

The terminals and heart and lung monitoring equipment have reduced sudden critical complications from 12% to .2% for patients recovering from cardiac surgery and have forced doctors and nurses to be acutely aware of their patients' conditions, according to a Mt. Sinai spokesman.

'Somewhat Crude' Terminals

Eight to 10 terminals are located in the Mt. Sinai ICU while two similar terminals monitor heart surgery patients at Wilford Hall Air Force Hospital at Lackland Air Force Base in San Antonio, Texas.

The "somewhat crude" CRT terminals, according to Hillard Fitzkee, their codeveloper and a biomedical engineer at Mt. Sinai, are alphanumeric devices with graphic capabilities and computer-controlled matrices.

They are quite unlike typical business-type computer terminals because they have a finer resolution, required for the patient trend analyses, than do ordinary graphics terminals, Fitzkee said.

The 18-bit units, modified by Fitzkee and coworker Richard DeAsla, are based on Princeton Electronics Products (PEP) CRT graphics terminals. The units operate with Tektronix, Inc. storage tubes equipped with Ascii keyboards made by Microswitch Corp., Fitzkee said.

Six additional terminals are located in doctors' offices to facilitate access to a particular patient's file, he noted.

These terminals, along with the two in Texas, are linked to a 48K, 16-bit-word IBM 1800 data acquisition unit in New York with four partitions, 22K of variable core and four IBM 1810 disk drives capable of holding 2M words of patient information, he said.

The system is used for a variety of reasons, he explained. It helps to integrate information from monitoring equipment at the bedside. It also relieves doctors and nurses of calculating intravenous drug dilution ratios and compiling clerical data on the patients, in addition to making all compiled data easily retrieved, Fitzkee said.

Another – actually the most important – function is automatically analyzing the condition of an open-heart surgery patient "on a breath-by-breath basis," rather than having to wait 30 minutes or more for laboratory analysis, he said.

In this way, he explained, the doctor can immediately determine if the patient's blood has too much or too little vital gas content in the critical 24- to 48 hours following the operation.

Being able to tell how fast the patient's condition is changing is most helpful, he continued. It has made doctors more aware of problems with postsurgery patients, eliminating the "ignorance is bliss" attitude unwittingly held by physicians supported by conventional equipment, he remarked.

High Reliability

The IBM 1800 process control machine was chosen for the medical application because of its high reliability, Fitzkee said, noting it is located in a room with primary and backup air conditioning equipment and un uninterruptible power supply.

The computer is running every hour of every day to service the terminals here and in Texas, he said.

Four analog signals send information to the CPU from a location between the patient and a mechanical respirator, monitoring 16 derived variables such as breath rate, oxygen consumption and carbon dioxide content, Fitzkee said.

The CPU "looks" at the patient's wave forms every 10 minutes for a trend analysis and assessment, although there is a special command for specifying two-minute-interval analyses to stabilize the patient, he said.

The analyses are displayed on the CRTs in the form of graphics and alphanumeric information for the physicians' use, he said.

Communications Link

At the Wilford Hall Hospital, information is sent through a communications link Fitzkee and DeAsla built from commercially available hardware because the standard communications adapter from IBM would have been too expensive for the additional core required for its operation, he explained.

The communications link is run on a synchronous start/stop basis at 2,000 bit/sec over dedicated voice-grade lines, he said, adding the error rate is low and the link is quite reliable.

The data from Texas passes through five channels on one half of the full-duplex line, with four channels for raw analog signals and the other channel digitally encoded for the key code commands, he said. Processed data returning from Mt. Sinai is all digital in format, he noted.

Part of Evaluation Study

The ongoing project at the Air Force hospital is part of an evaluation study to determine a standardized monitoring system for all hospitals in the U.S. with 400 beds or more, he said.

IBM will be involved in developing the bedside units, Fitzkee said. He also noted the system was developed 10 or 11 years ago by Dr. John Osborne of the Pacific Medical Center in San Francisco in cooperation with IBM.

Mt. Sinai was connected by phone lines to the West Coast center for two years before setting up its own system about two years ago, he indicated.

One of the reasons why more of these units are not in operation is that there is a large overhead cost for the computer and terminal monitoring equipment. It costs $30,000 to $35,000 for each bed, Fitzkee said, adding Mt. Sinai currently monitors 12 beds, although the system is capable of monitoring a total of 26.

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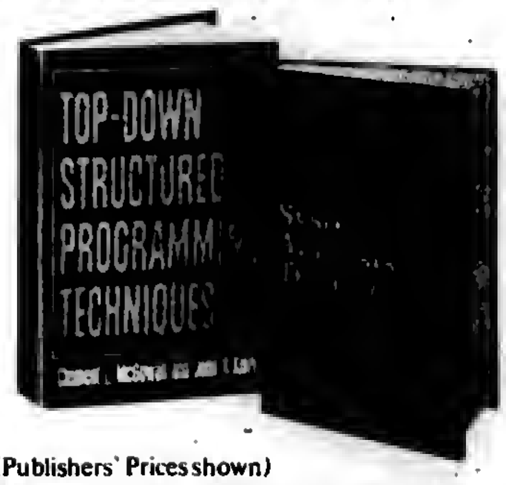

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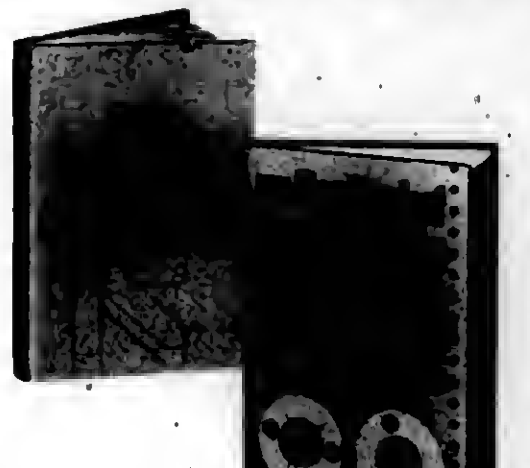

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Kit Allows Testing

PROVIDENCE, R.I. – International Data Sciences, Inc. (IDS) has introduced its Model 25 full-duplex long word converter, designed for installation in any Western Electric Co. 914B or Sierra Electronic Corp. 1914B data test set.

The Model 25 reportedly extends the capability of the test set to allow the full-duplex testing necessary to perform loopback tests and two-way, end-to-end tests of data transmission links.

It is a kit consisting of two printed circuit boards and hardware; a control panel; harnessing; and a switch-marking overlay, IDS said.

Installation of the kit device adds a 2,047-bit test pattern transmitter and receiver, the firm said.

The converter is priced at $750 from IDS at 100 Nashua St., Providence, R.I. 02904.

Detachable Keyboards Also Debut

Adds Introduces Burroughs-Compatible Terminals

HAUPPAUGE, N.Y. – Applied Digital Data Systems, Inc. (Adds) has expanded its line of CRT terminals with a unit designed to work with Burroughs mainframes and detachable keyboards for its standard Consul terminal products.

The Consul 980B is being offered as an alternative to or replacement for Burroughs TD 700 and TD 800 series of terminals, according to an Adds spokeswoman.

The unit offers additional standard features compared with the Burroughs terminals such as graphics capabilities; a security keylock; program attention and program function keys; a separate function keypad; and a separate numeric keypad, the spokeswoman noted.

The numeric keypad can be converted at no charge to a user-programmable function keypad, she said, adding it can still be used as a numeric keypad after conversion.

The Consul 980B also includes a full 96-character Ascii keyboard, parallel and serial peripheral interfaces; and communications speed capabilities up to 9,600 bit/sec.

Adds thermal and impact printers can be attached directly to the 980B to allow local printing; the printer offered by Burroughs for its terminals must be attached to the terminal controller, which prohibits local printing, Adds said.

The Consul 980B can operate either synchronously or asynchronously with all mainframes in the Burroughs B1700 through B7700 lines, according to Adds.

The 980B's CRT displays 1,920 upper and lower case Ascii characters in a 5 by 7 dot matrix format and includes simultaneous graphics and alphanumeric information display capabilities, the spokeswoman said.

There are 11,520 addressable graphic elements on the CRT and the graphics refresh rate is 60 frame/sec on domestic 980B models, she added.

The 980B costs $3,200 or $90/mo on a three-year lease.

Detachable Keyboards

Adds' D-Series terminal models have adjustable keyboards which can be placed up to two feet away from the terminals' display screens.

D-Series units – the Consul 520D, 580D, 920D and 980D – are identical to the standard teletypewriter-compatible models in the Adds line except for the keyboard connection, the firm noted. They are said to be about one inch longer than the standard Consul units.

D-Series terminals will be available by the end of this year and cost $25 more than the prices for the standard Consul units, Adds said from 100 Marcus Blvd., Hauppauge, N.Y. 11787.

WS Micro-Based Terminal Designed for Industry

EDINA, Minn. – The Computer Division of The Warner & Swasey Co. (WS) has introduced the RT-4, a microcomputer-based intelligent terminal system intended for heavy industrial applications.

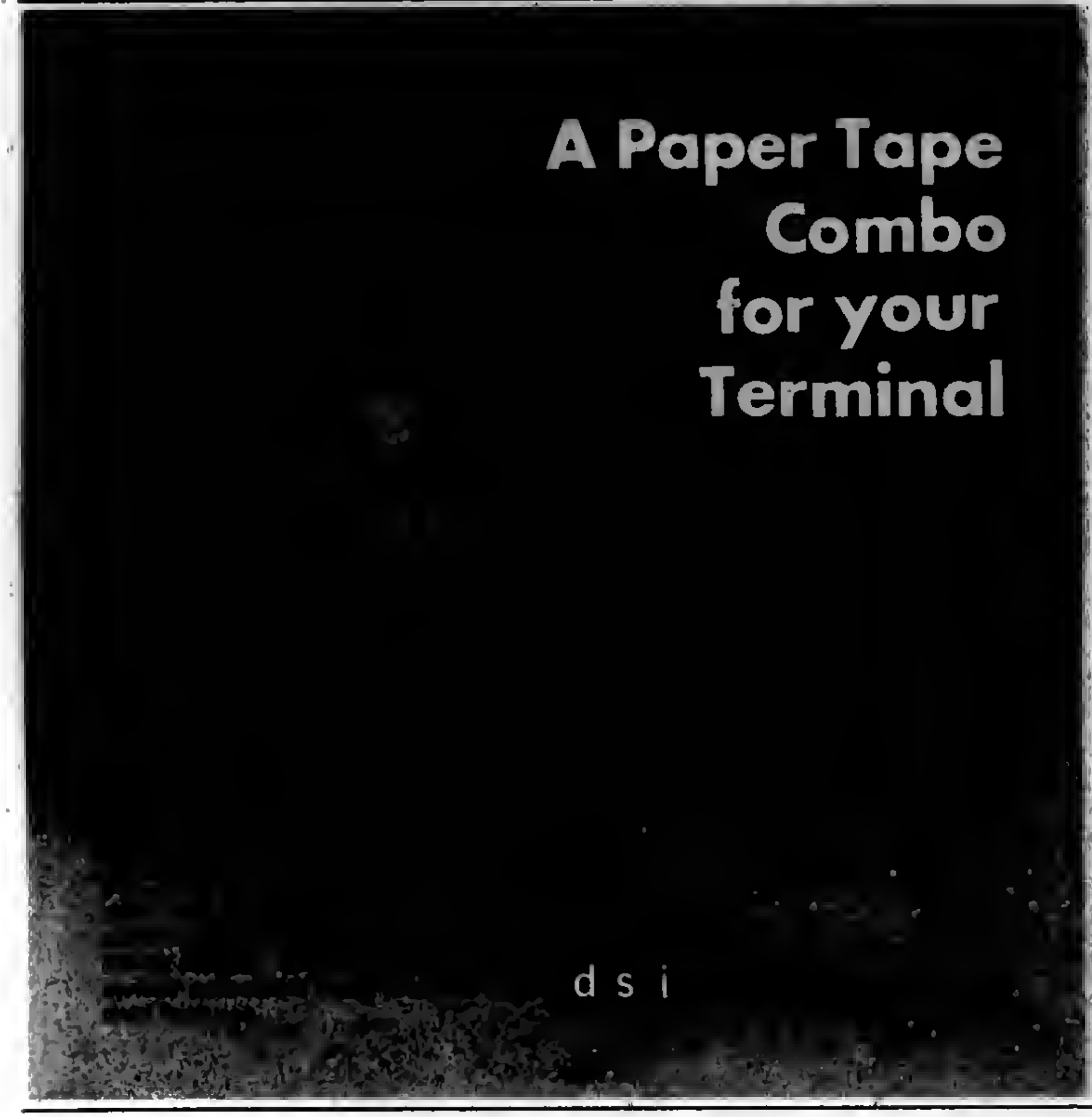
The RT-4 consists of a family of 4-bit microcomputer modules built around the Intel 4040. It can be used in energy management, remote process monitoring and control, security systems and machine safety monitoring systems, the company said.

The terminal system is comprised of a series of modules mounted on a motherboard, which includes a watchdog timer.

Available modules include a CPU; a memory module with 1K- by 8 bits of programmable read-only memory and 320- by 4 bits of random-access memory, WS said.

The system is contained in a wall-mounted oil- and dust-tight enclosure

A basic RT-4 system with CPU, memory, eight photo-isolated inputs, eight outputs, 20- or 60 mA current loop interface, power supply and enclosure is priced at $1,495, with a delivery schedule of 60 days, the spokesman said from 7413 Washington Ave. S., Edina, Minn. 55435.



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Based on Intelligent Terminals

Teleprocessing System Saves Trucker $26,000/Year

CLEVELAND, Ohio – A truck manufacturer here is not only saving time moving parts from inventory, it is also experiencing an annual cost reduction of $26,000 with a parts receiving and distribution system based on intelligent terminals.

Parts arriving at White Truck's central parts warehouse here include everything from nuts and bolts to truck engines and cabs. They are checked at the loading dock and then moved to a receiving area, according to a spokesman.

Under White's former receiving and distribution system, the parts sat on the dock for two or three days waiting for receiving clerks to search tub files for master records to process on an IBM 1031 data collection unit, according to Tom Boggs, senior systems analyst.

Parrot System

With the Parts Automated Receiving and Redistribution On-line Teleprocessing system (Parrot) receipts are ready to move to the final destination on the same day they are received, Boggs, the system's designer, said.

Parrot operates with two IBM 3270-compatible Sycor, Inc. Model 250 intelligent CRT terminal systems and two printers, one with 80-char./sec and the other 165 char./sec capabilities, he said.

The terminals communicate with an off-site IBM 370/158 operating under Taskmaster control. Communications are bisynchronous at 2,400 bit/sec over leased lines, Bogg said.

When the checker moves parts from the loading dock to the receiving area, the purchase order is left at the office. The receiving office clerk enters the purchase order number and the quantity of parts received on the terminal.

Parrot then checks the files on the 370/158 at White Motors headquarters here and confirms the parts were ordered and are due for delivery.

'Normal Conversational Mode'

"All of the communications between the operator and the 250 are in a normal conversational mode," Boggs explained. "There are no difficult codes for the operators to learn."

The terminal and Parrot then interrogate the receipt and notify the CRT operator of early shipments, overshipments and backorders. For emergency situations, the operator is allowed to override a predetermined action of the terminal, he noted.

Once the system has determined the order is valid, several operations occur. The storage area is determined and backorder information is checked. A move ticket is printed in the receiving office. And a save area information file is written at the mainframe, he explained.

The move ticket is given to the warehousemen as authorization to move the parts to the stocking location. When the parts are in the bin, a portion of the move ticket is returned to the receiving office and then sent to the central computer site.

Terminal Transactions

There the serial number is keypunched and entered into the CPU. Using the matched serial numbers, the mainframe updates the inventory file from the save area file, he said.

If the part received is on backorder, the terminal informs the operator how many parts are on backorder. The quantity needed to fill backorders is sent directly to the shipping area and the balance is sent to the storage area.

"This little feature of the system saves us several days in getting backordered parts on the way to customers," Boggs said.

Parrot can also inquire into the main inventory file and display available quantity information, last receipt date, bln location and other inventory data for a specific part, he added.

Another feature of the system allows the operator to add some information to the file on a purchase order.

"In some cases, a part number has been changed by the vendor," Boggs said. "With the add program, the operator doesn't void the entire purchase order, she simply changes the part number to conform with the files."

The system also allows the operator to delete a save area record through the use of the part serial number and to print any ticket that is lost in the warehouse, he noted.

A final feature allows the operator to list all the programs available with Parrot on the CRT screen and select the program needed for the operation about to be performed.

"There are two displays and two printers and we can run any two of the Parrot operations concurrently," Boggs said. "We can print move tickets on the fast printer and have an inventory status printing on the slower printer at the same time."

IDS Device Switches Modem To CPU Channels, Terminals

PROVIDENCE, R.I. – International Data Sciences, Inc. has announced the desktop configuration Model 8506-D selector switch used to switch the 25-pin RS-232 or CCITT V.24 interface to either of two outputs.

Utilizing the switching device, one modem may be switched to either of two front-end processor data channels or to either of two computer terminals, the firm said.

The module can also switch a data channel from its on-line modem to a backup modem or switch it from a leased line modem to a dial backup, it added.

The 8506-D costs $110 from IDS at 100 Nashua St., Providence, R.I. 02904.

This Scotch® data module has two extras built in.

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Even in Real-Time Applications

Disk Devices Can Operate With Over 90% Efficiency

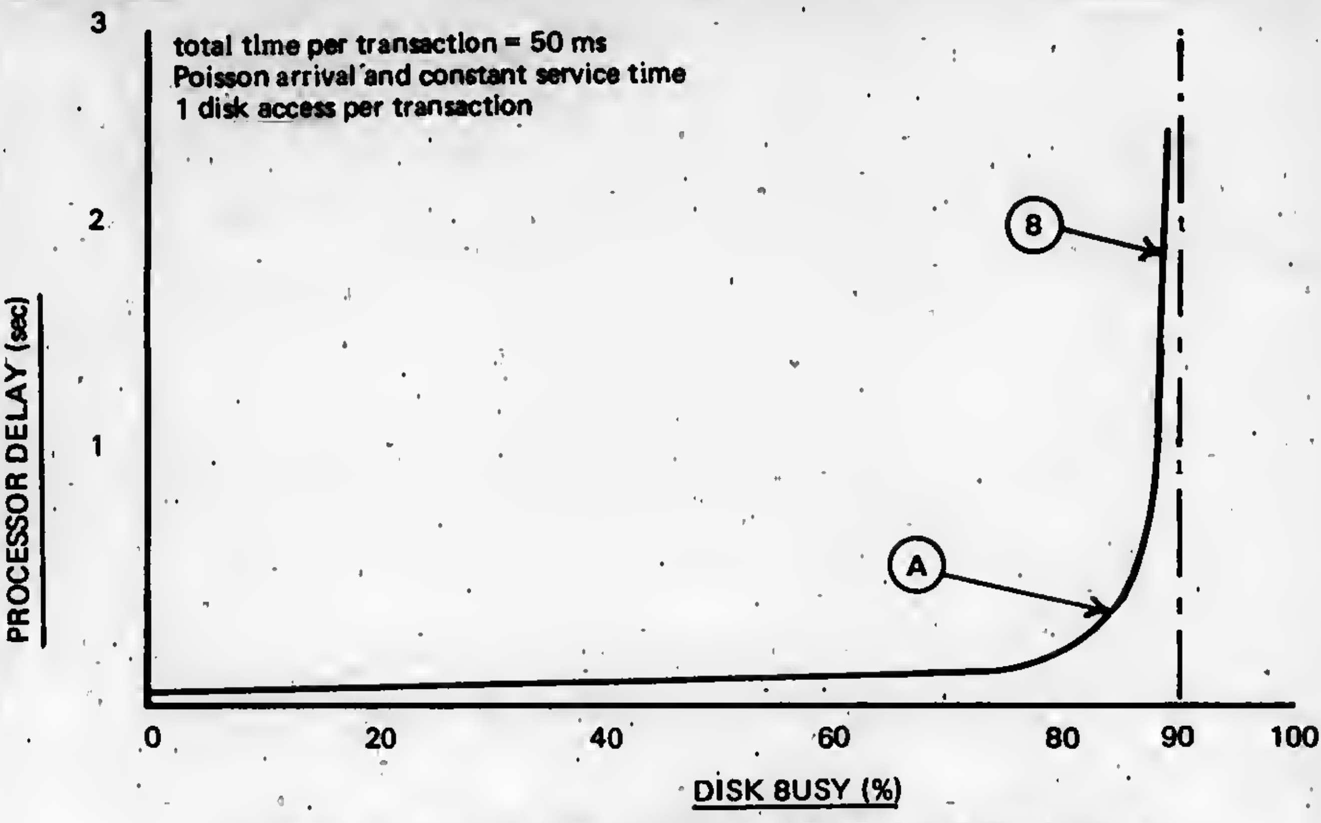

FIGURE 1. EFFECT OF DISK UTILIZATION ON PROCESSOR DELAY

By Saul Stimler
Special to Computerworld

Disk devices can frequently be utilized at more than 90% efficiency without adversely affecting performance – even in critical real-time applications.

There are two broad capability considerations in the use of disk devices. One is storing the maximum amount of data per disk. The second is utilizing the maximum number of data transfers per second.

This article addresses the establishment of the maximum number of data transfers per second for a specific system.

This maximum is termed the operational capability and is defined as the maximum number of data transfers per second which will still permit meeting the timeliness requirements of the user outputs.

To introduce the method, consider a simple, 50-terminal real-time system which is used to obtain the status of customer accounts. Assume the application program and software are resident in main memory; the customer file completely fills one disk device; each transaction requires the reading of one 4,000-byte record from the disk; 5 msec of CPU time and 45 msec of disk time are expended serially per transaction processed.

In this system, therefore, each transaction requires a total elapsed time of 50 msec within the computer subsystem. The maximum possible disk utilization is 45 msec out of every 50 msec, or 90% busy. This would occur when one transaction is processed every 50 msec (which equals 20 transactions per second as well as 20 data transfers per second).

Timeliness Requirement

To establish the operational capability of the disk device, a timeliness requirement is necessary. Suppose that to meet terminal operator turnaround time requirements, the average busy hour delay within the processor subsystem is not to exceed two seconds.

Many measurements on operational systems have confirmed the results of simple queuing theory illustrated in Figure 1 describe simple real-time systems receiving inputs from more than 15 independent terminals.

The dot and dash line in Figure 1 marks the 90% maximum possible utilization of the disk. As the input rate increases to cause the disk to be more than 85% busy, the delay in the subsystem increases very rapidly.

(Continued on Page 42)

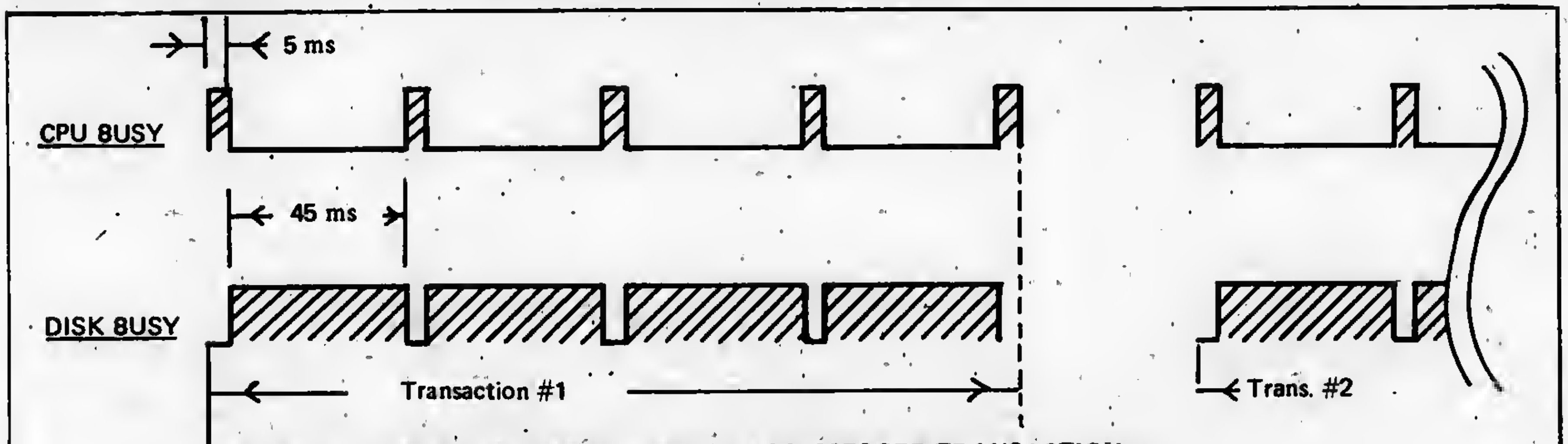

FIGURE 2. TIMING DIAGRAM FOR 4 DISK ACCESSES PER TRANSACTION

Cray-1 Gets Option

MINNEAPOLIS – Cray Research, Inc. has announced an optional error-correction capability for the Cray-1.

The option provides for correction of single-bit errors as information is read from or written into the computer memory, the firm said. Double-bit errors also can be detected and flagged.

The option adds eight check bits to each 64-bit word in the memory which facilitate the detection and correction, a spokesman added.

The CRAY-1 computer system is offered with memory sizes of a quarter-million, half-million and one-million words. Error correction options are priced at $295,000, $395,000 and $495,000 respectively; respective lease charges are $6,500, $10,500 and $15,500 per month, he said.

Cray Research is at 7850 Metro Parkway, Suite 213, Minneapolis, Minn. 55420.

Tab Unveils Key-to-Diskette Systems

PALO ALTO, Calif. – The Tab Products Co. 700 series of key-to-diskette data entry systems are designed for centralized, decentralized, and remote teleprocessing environments, the firm said.

Two versions of the 700 are available. The first is a single-station 701 which can be upgraded to the second, a dual-station 702, at the user's site with the addition of a second diskette drive, keyboard and tabletop, Tab said.

The series prepares and processes data on IBM format diskettes. When equipped with optional I/O interfaces, it transfers data records to and from a central CPU, the company noted.

The systems can be used in stand-alone or terminal mode with RS-232C, bisynchronous or standard teletypewriter interfaces, it added.

A single-station single-drive 701 includes 20 program levels, automatic program sequencing, multilevel program sequencing, a record length of one to 128 characters, search on record address, sequential content, content and end of data and operator prompting and verification.

The 702 features 10 program levels per station, the firm added.

Optional features for both units include a second diskette drive with disk copy for the 701, disk initialization, accumulate field totals and additional program levels.

The basic 701 costs $4,950 and the 702 costs $6,160, the firm said from 348 Waverley St., Palo Alto, Calif. 94301.

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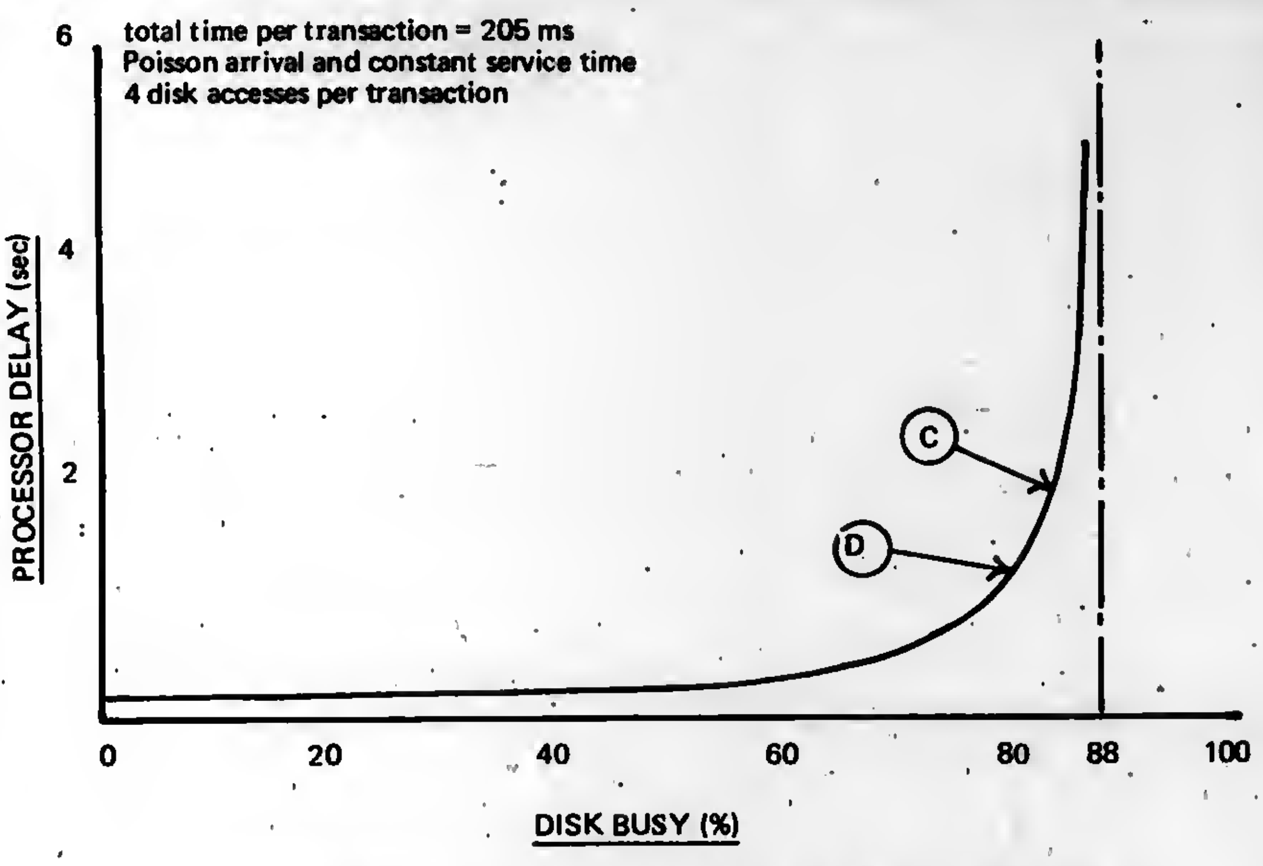

FIGURE 3. EFFECT OF DISK UTILIZATION ON PROCESSOR DELAY

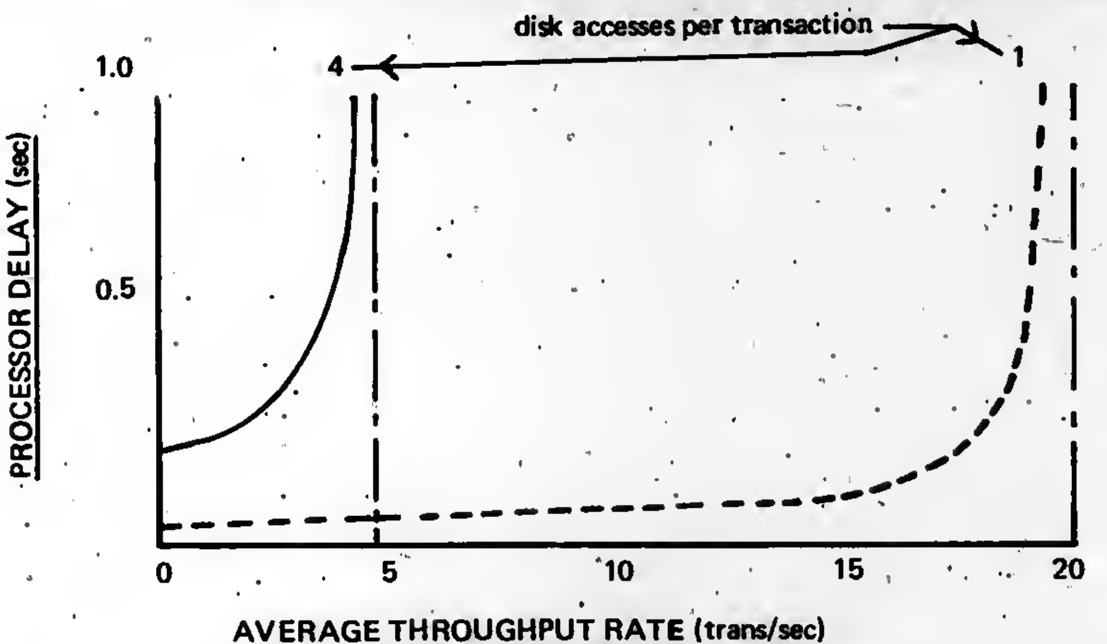

FIGURE 4. EFFECT OF AVERAGE THROUGHPUT RATE ON RESPONSE TIME

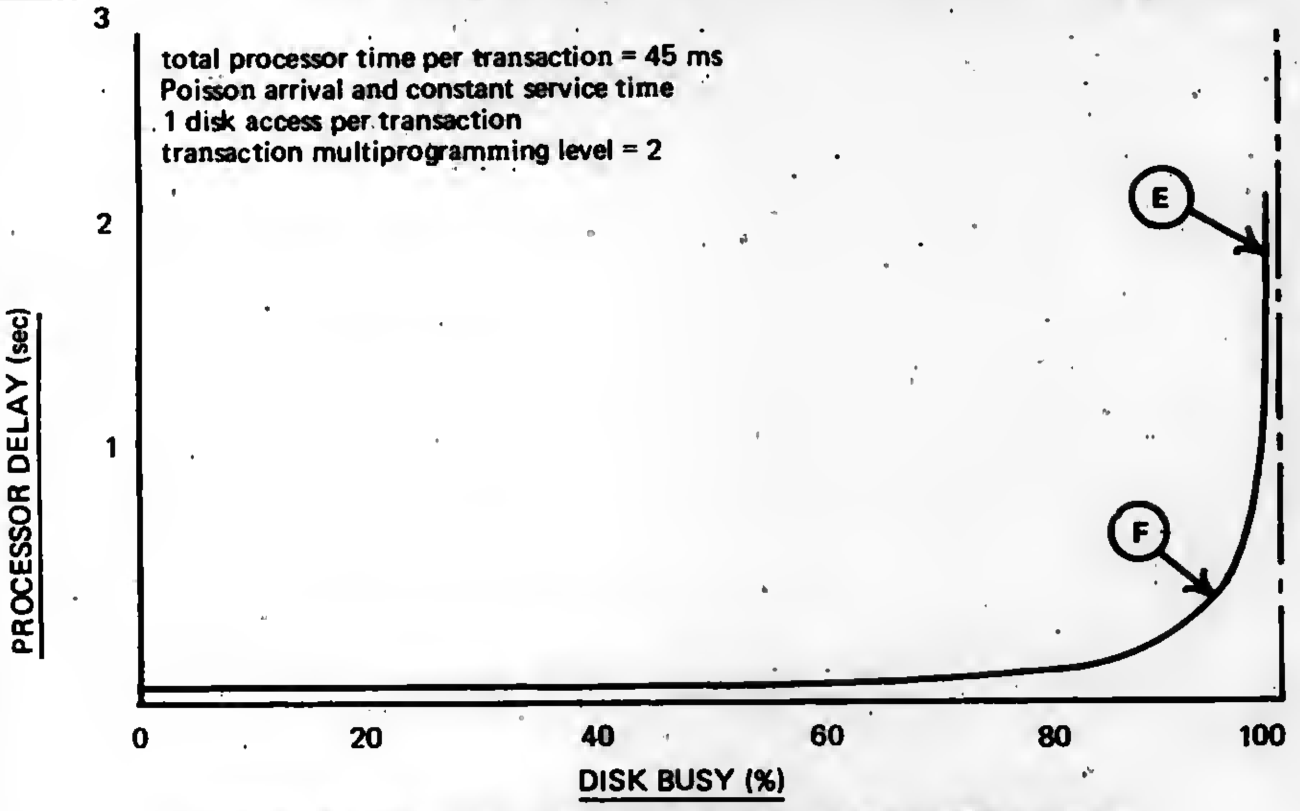

FIGURE 6. EFFECT OF DISK UTILIZATION ON PROCESSOR DELAY

(Continued from Page 41)

It is the determination of the location of this knee of the curve that is the important value in developing such figures.

From the figure, the two-second delay requirement is reached when the disk is 89% busy. As a practical matter, the operational capability would be set at the knee of the curve which is 85% busy.

More Complex Application

Next, consider a somewhat more complex application in which all the conditions are the same as for the first example except each transaction requires four disk accesses and five 5-msec CPU periods.

Figure 2 is a timing diagram for this application. The time per transaction is 180 msec disk time and 25 msec of CPU time totaling 205 msec per transaction.

If one transaction were processed every 205 msec, the disk would be busy 180 msec of each 205 msec or 88% – the maximum possible utilization for this disk.

Figure 3 indicates the calculated delay within the computer. The knee of the curve is at 80% disk busy which would again be used as the operational capability, even though the two-second delay would have been met at 83% busy, Point C.

Figure 4 illustrates the difference between the two systems discussed when viewed from the transactions per second processed viewpoint.

Two Transactions

Having briefly examined serial processing of transactions, the one access per transaction system described above is now examined assuming two copies of the application program are in memory or the application is reentrant.

Two transactions can be processed in a multiprogrammed mode. The timing diagram is shown in Figure 5.

Because the CPU processing for one transaction can be overlapped with the disk transfer for a second transaction, the disk can be utilized to a maximum of 100% busy.

The maximum transaction rate within the processor is one every 45 msec. As the rate of input transactions approaches the maximum, a queue builds up for the disk.

Figure 6 illustrates the effect of disk busy on processor delay. Between 98% and 99% disk busy (Point E) the processor delay reaches the 2 second requirement.

For this system, the practical operational capability of the disk is about 94% busy which is the knee of the curve, Point F.

Operations More Complex

In practice, the processing operations are usually more complex than those described. However, I have found simple queuing considerations adequate to develop utilization guidelines for disk devices and CPU as well as the other system components.

Actual measurements on operational systems have shown disk devices can be satisfactorily used at about the calculated operational capability. Satisfactory operation with disks 90%-plus busy have been measured on heavily loaded systems.

It should be emphasized that a considerable depth of knowledge and understanding are needed to effectively utilize the methodology.

Stimler is an independent consultant located in Moorestown, N.J. 08057.

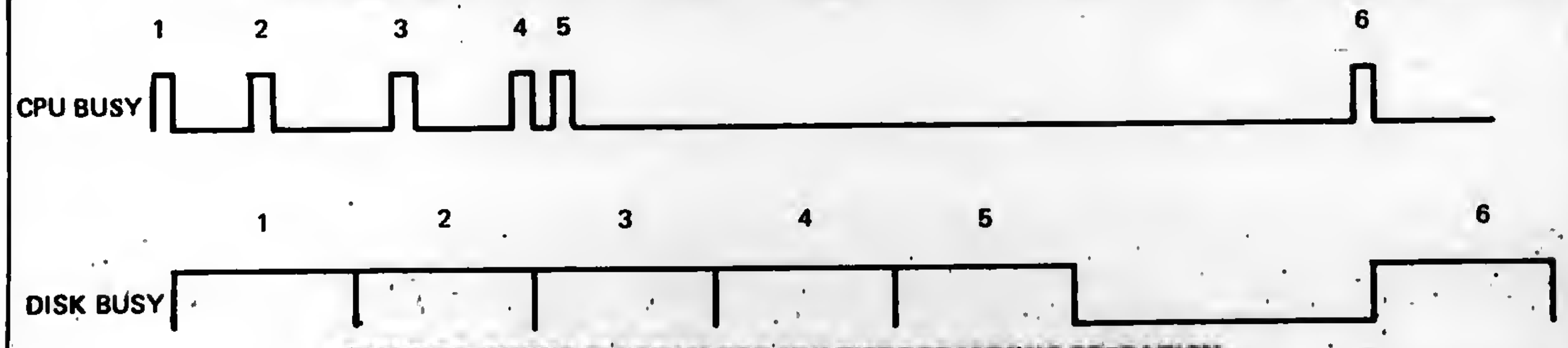

FIGURE 5. TIMING DIAGRAM FOR MULTIPROGRAMMING OPERATION

Cassette Works at Rugged Sites

ST. PAUL, Minn. – The No. 834 Certified Digital Cassette from 3M Co. features an enhanced oxide component to achieve high signal output and increased environmental stability, the vendor said.

The enhanced magnetic coating does not soften at high temperatures or become brittle at low temperatures, a spokesman said.

Exceeds NBS Standards

The unit's signal output exceeds National Bureau of Standards standards for reference and standard tapes by 20%, he added.

Ansi-standard "write enable" plugs are optional to prevent recording over a tape's contents.

The cassette costs about $6 with quantity discounts available, 3M said from the Data Recording Products Division, P.O. Box 33600, St. Paul, Minn. 55133.

Cummins-Allison 4216 Gets OCR Capability

GLENVIEW, Ill. – Cummins-Allison Corp. has added a dual optical character recognition (OCR) read capability to its Model 4216 reader/sorter, the vendor said.

Simultaneous Scanning

The feature allows two OCR printed lines to be simultaneously scanned using the company's standard OCR fonts; combined with a magnetic ink character recognition (Micr) reading capability, the enhancement allows speeds of up to 650 document/min to be handled, the firm said.

The 4216 costs $69,750 for a 13-packet reader/sorter with OCR and Micr reading capability. The two-line scanning feature costs $24,750, the company said from 800 Waukegan Road, Glenview, Ill. 60025.

Cleaning, Retensioning System Removes Magnetic Tape Errors

WALTHAM, Mass. – The Kybe Corp. high-speed magnetic tape cleaning and retensioning system is said to remove over 95% of read/write errors from computer tapes.

At 300 in./sec, the E-24 Mod VI system cleans a 2,400-inch reel of tape in less than two minutes and handles a full clean, retension and restack cycle in about three minutes, the firm said.

The system uses two sapphire cleaning blades to remove error causing particles from the tape's oxide surface, restoring precise head-to-tape contact on tape drives, it added.

Three auto-advancing cartridge tissues wipe away particles that adhere to the tape due to static electricity or magnetic attraction. The system also retensions the tape and stacks it on the supply reel, Kybe explained.

The Model VI has features to improve tape retensioning ability including direct drive motors to replace belt pully linkages, CMOS circuitry to control the system and interlocking controls to prevent tape damage from operator error, according to the firm.

A fail-safe breaking system gently stops the tape if the power fails, the firm noted.

The unit costs $2,650 from 132 Calvary St., Waltham, Mass. 02154.

KW Frequency Converter Has Low-Noise Volume

DEER PARK, N.Y. – KW Control Systems, Inc. has a low-noise 415-Hz frequency converter for IBM 370/168 and 370/158 systems, according to a KW spokesman.

The enclosed unit converter features a 55-decibel noise level which is said to be quieter than computer room air conditioning background noise.

The unit can be installed in the working area of the computer room; it rests on a raised floor without fasteners or supports, the spokesman indicated.

In a typical 370 installation, the user will have two converters for one CPU.

Each unit is connected to the CPUs via a manual selector switch or automatic parallel control. With automatic control, the system allows redundant operation of both converter units for multiprocessor applications.

In a multiprocessor setup, three frequency converters are operational with one acting as a spare, the firm said.

The system costs $16,800, the firm said from 151-17 West Industry Court, Deer Park, N.Y. 11729.

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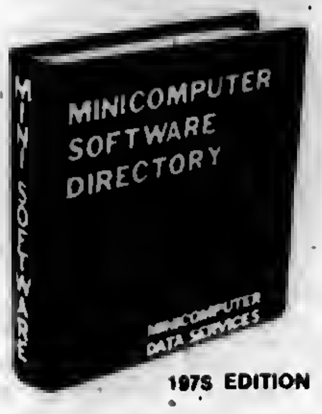

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In Their 'Spare Time'

COM Systems Help Companies Publish Catalogs

CULVER CITY, Calif. – With the help of computer output microfilm (COM) systems, companies are now able to take computer-stored data and produce book-quality catalogs, according to James Callaghan, vice-president of marketing for Information International, Inc..

Previously, companies with large publication loads had to set their work in type and ship it to a printer who published copies, Callaghan said.

But now, publishing is becoming one more task assigned to the DP center, he added.

Not only is the data more readable, it is produced for less cost and faster. Hence, more and more retailers and manufacturers are becoming publishers in their "spare time," he said.

"The days of time-consuming typesetting, editing and, especially, pasting up galleys into page proofs are disappearing," Callaghan claimed. "Computers are streamlining the process, reducing the time involved while boosting the quality and accuracy of the resulting publication," he asserted.

Now, data is inserted into a computer through CRT terminals. Operators type information on a keyboard and review the text on the screen, typing appropriate changes or corrections on the spot, he explained.

Unlike text produced by typesetting machines, which requires totally new resetting when it is updated or revised, the electronic process involves storing the copy on disks. The text then can be recalled on the screen at any later date and revisions can be made, he added.

A software program within the CPU governs how the text eventually should appear – the type face and size, width of lines; how word breaks at the end of a line should be handled; and how short lines at the top or bottom of a column should be adjusted, he continued.

Disk to Tape Transfer

When the text is ready for publishing, the data is transferred from the disks to magnetic tape and the tape is inserted into a COM system which reproduces the text as complete pages in film form or as page proofs, Callaghan explained.

Printing press plates are derived from these versions for use in publishing, he added.

"One of the major advantages of such systems over previous mechanical operations is the ability to store information in the computer," Callaghan commented.

"In conventional typesetting, one must start from scratch every time a directory, list or manual needs updating or revision. But with the computerized systems, one need only make the changes, additions and deletions to the basic store of information," he explained.

Automobile Publications

For instance, Chrysler Corporation uses a COM system in publishing price and parts lists, directories and catalogs. Previously, the automaker depended on outside vendors for composition and typesetting, according to Callaghan.

Adopting its own system enabled the firm to cut per-page costs for its price lists from $15 to $2. Turnaround time in production is shorter and accuracy is improved, he added.

The Chrysler publications range from a 120-page internal telephone directory which comes out annually to a 3,000-page parts catalog which is the prime source of service and replacement information on chassis parts for cars and trucks.

Also churned out on Chrysler's presses are a 1,200-page master parts price list issued bimonthly, another 1,000-page annual price list and a 2,000-page annual flat-rate manual indicating the serviceability and labor charges appropriate for repair work on Chrysler cars and trucks.

Outside the auto industry, a leading aerospace company uses such equipment to produce technical manuals, catalogs, telephone books, proposals and numerous internal documents.

Lockheed Missiles & Space Co. devised its own software composition program, called Autotext Publication System, to govern production of these publications, according to Callaghan.

Graphics System Gets Enhanced Features

SALT LAKE CITY, Utah – Evans & Sutherland Computer Corp. has introduced an enhanced computer graphics line drawing system.

The Picture System 2 is an updated version of the firm's Picture System and both systems are software compatible, the firm said.

The system features a faster update rate, increased line presentation of 21,500 lines per 30th of a second and a larger number of characters.

A standard system with a picture processor, memory, refresh controller, line generator, character generator, CRT, data tablet and work station costs $65,500 including a Graphics Software Package, he said.

Evans & Sutherland is at 580 Arapeen Drive, Salt Lake City, Utah 84108.

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Cost of Ownership Major Criterion in Printer Choice

SAN FRANCISCO – "The single most important consideration in the selection of a printer, after basic performance specifications, is the total cost of ownership," according to Ken Freund of Dataproducts Corp.

The most obvious place to start in selecting a printer is with the performance requirements needed "today and in the foreseeable future," Freund told a group here recently.

Questions that should be answered include: What speed machine is required? How many pages of output will be generated over what time frame? What is the typical character density, both horizontal and vertical, which is anticipated?

Can slewing to top of form increase throughput? How many hours per day will the printer be used? Is matrix print quality acceptable? What types of forms will be used – custom or stock – and how many parts?

The total cost includes the initial purchase price, supplies, maintenance and spares over the expected life of the equipment.

"When analyzing competing equipment, it is not unusual to discover that an inherently superior product with a higher initial cost will, over its life, incur a lower total cost of ownership," Freund said.

Maintenance Costs

Printer life-cycle cost analysis requires consideration of the mean tima between failure of the unit, based on the basic construction of the printer, he said.

If the unit is not soundly designed, maintenance can become a costly problem. The simpler tha design, the more reliable the unit, he claimed. If a unit is designed simply, it should require a minimum amount of maintenance, he added.

Users with volume printing requirements should not use printers needing special paper unless some other overriding consideration, such as plotting capability, is involved, he noted.

Applications requiring multiple copies incur significant additional expense if secondary reproduction techniques must be employed.

Ribbon expense can also become substantial over the life of the printer and users should consider the anticipated ribbon life, Freund said.

Consider Print Quality

Print quality is another area users should consider when purchasing a printer. "The basic objective of good print quality is to have output which can be easily and accurately read." Individual characters should not be fuzzy, misregistered or have background clutter, he added.

If a user plans to use a form or print paper, he should request print samples be run using his paper with both new and used ribbons, Freund amphasized. If multipart forms are to be used, additional samples should be requested to assure an acceptable last copy, he said.

Users should also make sure the printer conforms to local and state governmental codes for safety purposes.

Operator Acceptability

Operator acceptability is another area many users overlook when selecting printers, Freund said.

"Loading should be easily accomplished in a minimum of time without awkward physical contortions on the operator's part," he said.

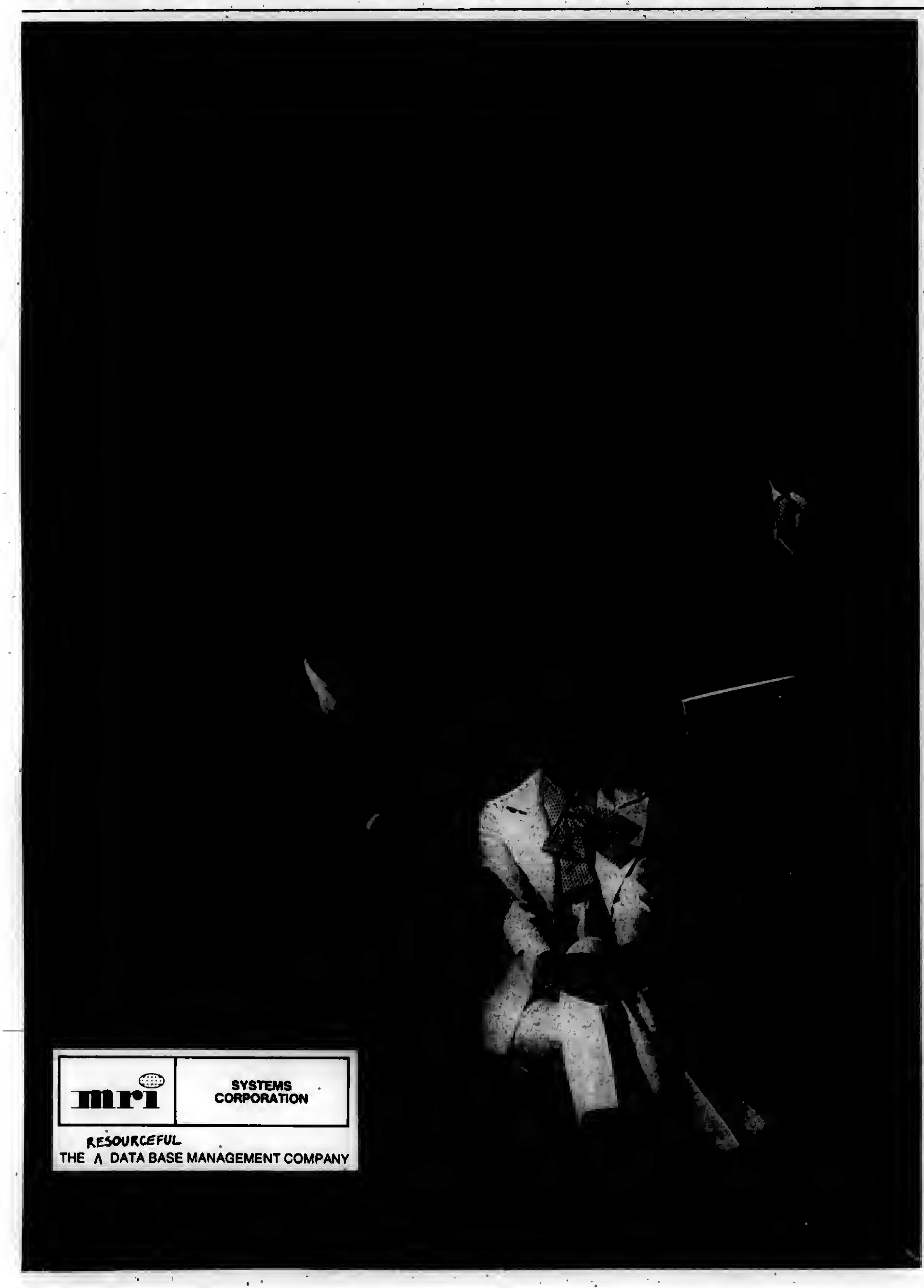
If pin feed paper is used, tractor face plates should be exposed and the tractor teeth should be clearly visible when loading the paper. Paper tension between tractors should be adjustable while the printer is running, he added.

Simple Controls

Controls should be simple so "as many control functions as possible" are performed automatically. Those that are present should be labeled, he said.

To allow operators to identify system problems and initiate corrective action, an indicator panel which identifies the condition of major printer subsystems, rather than just registering an alarm, should be included. By distinguishing operator correctable faults from those requiring technical expertise, unnecessary service can be eliminated, he explained.

Quiet operation is another consideration since printers are sometimes placed in working environments rather than in computer rooms, he noted.



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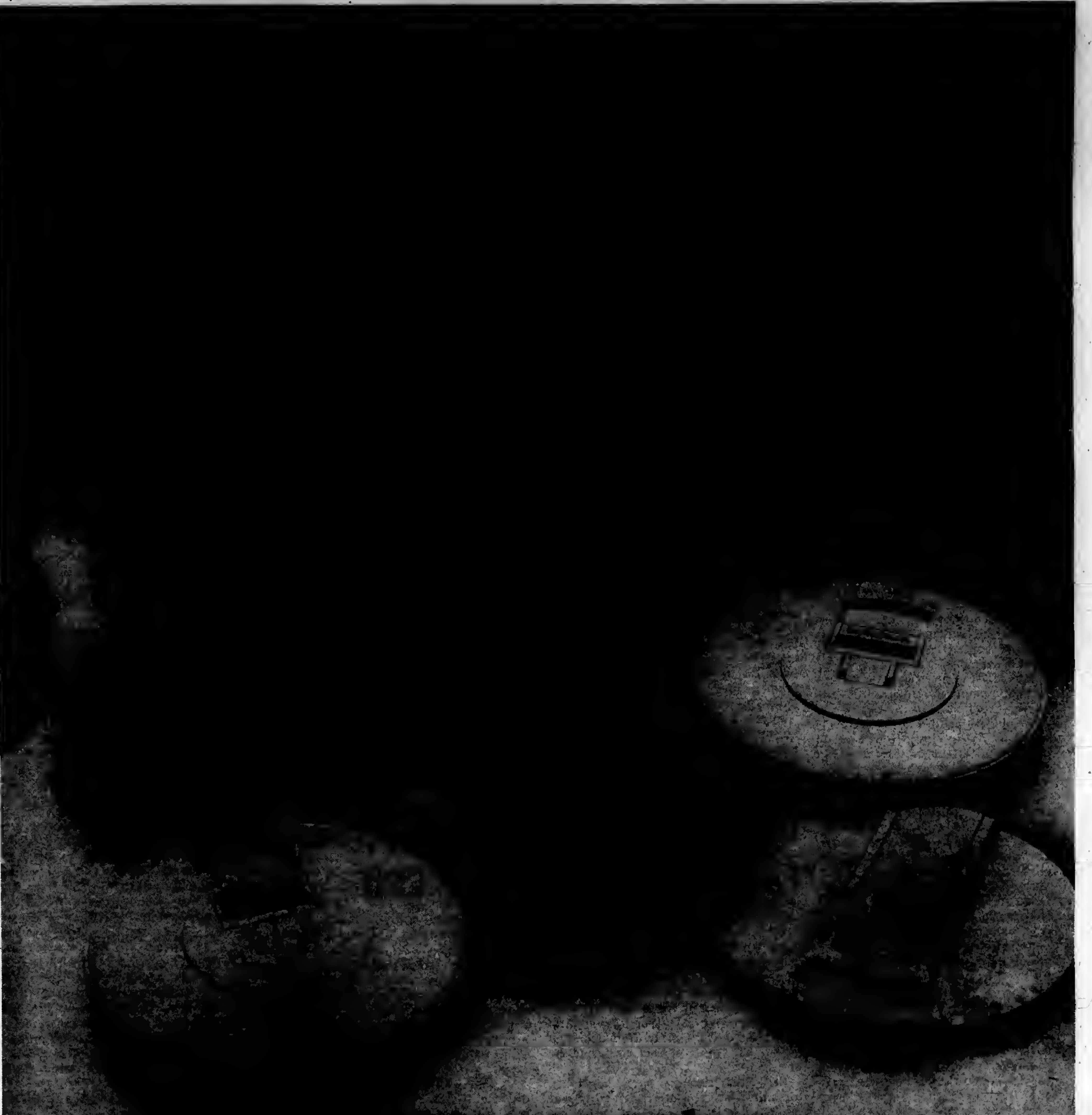

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For 32-Bit Minis

Non-Local Shared Memory Introduced by Interdata

OCEANPORT, N.J. – The Interdata, Inc. Multiport Memory System allows up to 14 32-bit minicomputer CPUs to shere up to 870K bytes of nonlocal memory as an "alternative to the large mainframe approach," according to a vendor spokesman.

Operating with Interdate 7/32 or 8/32 CPUs, the core memory runs under Interdata's most recent release of the OS/32MT multitasking operating system. The operating system of each processor in the configuration treats the multiport memory as an extension of its own local memory, the spokesman explained.

The operating system provides for discontiguous memory support and multiple Task Commons to allow for the configuration of the non-local memory, the firm added.

Shared Memory Limited

The amount of shared memory in the system is limited by the processor in the configuration with the largest complement of local memory; if the largest local memory is 256K bytes, total Multiport Memory is limited to 744K bytes, the spokesman explained.

All Interdata CPUs can directly address 1M byte of memory, he added.

Memory modules are available in 32K-byte blocks with a 750 nsec cycle time and 64K-byte blocks with a 1,000 nsec cycle time. The shared memory can be used in contiguous, half-word interleaved or full-word interleaved mode.

Each multiport memory bank consists of up to eight boards of memory; the largest bank contains 512K bytes. The multiport memory controller allows either "round-robin or fixed-priority access to memory," Interdata noted.

A system is configured by connecting an extended direct memory access bus and an interface to each CPU. A pair of interfaces is connected to a single multiplexer, which is attached to the controller located in the memory bank. The processors are then assigned priorities, Interdata said.

Typical multiport applications include aerospace simulation system design and electric power distribution, the vendor added.

The largest configuration with 14 processors can contain eight memory banks with a total of 112 I/O ports. Each memory bank operates asynchronously and independently of others in a multiple memory bank system with multiple memory uses.

Aggregate throughput rates can exceed 20M byte/sec because a CPU can transfer data from a storage device into multiport memory while simultaneously accessing local memory, the firm said.

A one-benk, two-port contiguous 64K-byte system costs $18,600; e four-bank, two-port system with 128K bytes of memory costs $54,500. Interdata is at 2 Crescent Drive, Oceanport, N.J. 07757.

IBM Extends 3/12 Memory

ATLANTA – IBM 3/12 users can expand their system's memory up to 96K bytes with two additional memory sizes for the system introduced recently.

An 80K-byte memory capacity was also announced.

The memory sizes were designed to give users "greater flexibility in running both batch and on-line interactive programs concurrently," an IBM spokesman explained.

Current 3/12 users can upgrade to the increased memory sizes, which will be evaileble in June 1977, in the field, he added.

To go from e B18 – the 3/12 with 64K of memory – to the C19 with 80K of memory will cost $8,350; to upgrede from the B18 to e C20 with 96K bytes of memory will cost $11,050. The total time for an upgrade is less than eight man-hours, IBM said.

The 3/12 CPU with 80K of memory will cost $64,215 and rent for $1,862/mo under the Monthly Availebility Charge (MAC) or $1,693/mo under the Term Availebility Plan (TAP). The 96K-byte 3/12 will cost $66,915, $1,967/mo under MAC or $1,788/mo under TAP.

Small System Solves Big Business Woes

By Esther Surden
Of the CW Staff

DALLAS – A minicomputer at Burgess Industries, Inc. here is solving the large business problems typically encountered by small- to medium-sized businesses who can't afford the mainframe epproach, according to Benjamin R. Peek, a consultant to the firm.

Burgess has multiple operating divisions, a retail/wholesale distributed network of stores, multiple manufecturing facilities and sales offices. The firm has been in business for over 40 years end has e mix of older managers and new aggressive management as well as a mix of new products and mature product lines, Peek said.

Burgess had reached the point where its manual information system had become expensive, late and prone to error; with sales at $40 million, however, the firm could not consider a mainframe system because of cost.

A large staff of programmers to support a large-scale system was elso not affordable by the firm, Peek emphasized. Management had decided the cost and risk involved in trying to develop a programming capability in-house was beyond reasonable business risk.

"Almost the only alternetive to the Burgess kind of company is the mini/micro approach, but only if the software can be made to conform to Burgess business procedures end if software costs can be structured within the economic resources of Burgess as a reasonable business risk," he said.

Determining the Risk

Burgess determined its risk by equating the entire system cost to the salaries it would have paid and extrapolating potential benefits such as the ability to quote against customer requirements.. It found it could recoup the system investment in less than 10 months, Peek indicated, with a hardware investment of $139,000, e software investment of $20,000 and about $13,000/mo for the first year in additional software costs.

The major problem with any information system being developed, Peek said, is the proper implementation of a philosophy of operations which incorporates standards for analysis, deta base design, programming, testing, documentation, maintenance end operations of the information systems function.

The firm took the four months before the system was delivered to develop this and write some applications programs.

The philosophy that emerged at Burgess specified:

- The system would be transaction-driven and run in real-time with the user interfacing through a CRT. The CRTs would be easy to use by non-DP-oriented people.
- All reports would be controlled locally and printed on demand of the user.
- All the applications would share a common data base.
- Company business procedures would be reviewed and revamped to optimize ways of doing business and to conform with actual data flow.

It was also assumed the system's center would also be a profit center, Peek noted.

System Configuration

The Burgess staff has only six people, three Burgess employees and an average of three consultants. A Varian V75, delivered last January, includes a CPU with 128K words of semiconductor memory, 100M bytes of disk, 300 line/min printer, data communications multiplexer, Houston Instruments plotter and various CRTs and remote printers.

Softwere includes the Vortex II operating system, Vortex Telecommunications Access Method, Fortran IV, Cobol, RPG-II and RPG-IV, Cincom Systems' Total data base management system, Basic and Assembly language, he said.

(Continued on Page 51)

Diablo 3200 Business System Features Micro-Based CPU

BURLINGAME, Calif. – The Diablo 3200 from Shasta General Systems is an Intel 8080-based system designed for small business users.

The microprocessor-based CPU, manufactured by Diablo Systems, Inc., features a 500 nsec random access memory of up to 65K bytes which is shared by applications programs, a diskette-based operating system and other system software, the firm said.

With direct memory access capability for both CRTs and diskettes, the system can accommodate a range of Diablo peripherals, a spokesman added.

Both standard and word-processing versions of the Hytype II printer, the Diablo 200 char./sec matrix printer, dual diskette drives, a 1,920-character CRT and the Diablo Series 400 drives which will be available next year can attach to the 3200, he said.

Application software includes order entry, invoicing, accounts receivable, accounts payable, general ledger, inventory control end payroll programs. The system is programmed in a language described as a high-level compiler similar to extended Basic which works with a resident interpreter.

A 3200 with 3M characters of on-line diskette storage, a keyboard/CRT console, the word-processing version of the Hytype II printer and applications programs costs about $25,000 depending on the number of applicetions involved. Shasta is at 895 Stanton Road, Burlingame, Calif. 94010.

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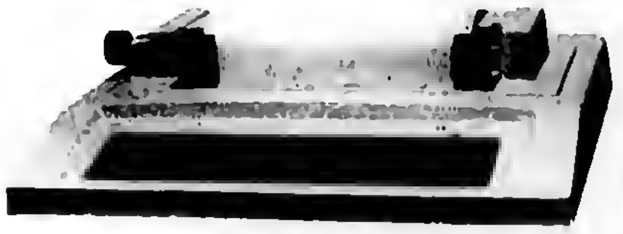

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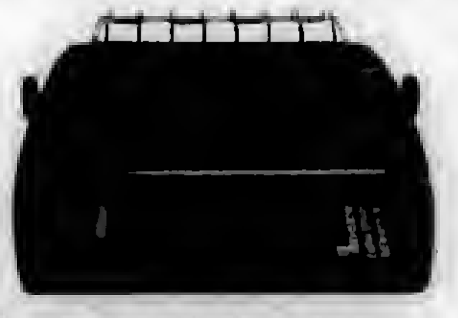

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Minicomputer Maintenance Service Not Terrible

By Paige L. Chilson

Special to Computerworld

Minicomputer Exchange

I disagree with many of the statements made in the article "Mini Service Not Too Good" by Jon David [CW, Oct. 4].

For example, the quote "if a printer goes down, a disk goes down or whatever, the entire system is effectively unusable," should have been explained in more detail. The only time a complete system becomes unusable is when the CPU itself goes down.

Minicomputers are harder to operate and require more human intervention and more computer knowledge than their larger counterparts.

Normally minis are bought as a cost option to the larger systems and are placed in businesses where the operational responsibilities fall on one person who also has other responsibilities in the firm.

Minis are always undersold and underconfigured. Because cost becomes an important factor, an inferior system is purchased.

If a printer goes down, it is seldom down hard (100% out of operation) and even when it is completely out of operation, the system is still not "effectively unusable."

I still can input my data update records, manipulate files and read information out to the console which constitutes 80% of the work I am trying to accomplish. If I have a service contract with a reputable maintenance firm, my printer is back in operation within a short period.

"Minicomputer maintenance is probably the weakest area . . . " is another statement with which I disagree.

Weakest Area

Problem determination is, I believe, the weakest area in the entire minicomputer field; many software malfunctions are contributed to hardware failure and the reverse is also true.

Software maintenance, proper documentation of system operations and user oriented training as to what the program is attempting to accomplish (not what the user believes the program is doing, but what actually was written by the programmer) is as important as the proper hardware maintenance team.

Intermittent hardware or software problems play a large role in the inconsistencies of minicomputer maintenance and directly relate to problem determination.

The service company is called to fix the problem. Three or four hours later, the customer engineer (CE) arrives, works on the problem for two or three hours and cannot get it to fail using approved diagnostics and the problem does not occur again.

The CE says there is no problem or announces he fixed it and goes on to his next call.

The machine is neither fixed nor has the problem been determined, but the problem will return until the software or hardware bug is fixed.

The comment, "A maintenance person gets familiar with a piece of equipment just in time to see it discontinued," is another misleading statement.

I became familiar with printers, disk drives, tape drives, CRTs, card readers, etc. 10 years ago and they are still around today.

I admit there have been many changes to enhance the disk drive, but the basic philosophy of the disk remains the same and a good maintenance person need only be "brought up to date."

David referred to servicemen being taken from one company to the next and service departments hiring the best personnel they can from their competitors. He said this hurts the minicomputer industry. He also said the minicomputer industry suffers from an environment with considerable maintenance force turnover which hurts customer service.

Why single out the minicomputer industry? The minicomputer service work is only as reliable as the people you are dealing with, which is the same as with large systems.

When Comma Corp., Control Data, Raytheon, Sorbus, Itel and many more companies went into the IBM third-party maintenance business and hired CEs from IBM, did IBM provide poor service or fail?

The statement, "Since service is not done on a contract basis with the manufacturer, requests to the manufacturer for replacement parts normally get lowest priority, so even the most trivial repair may require a system to be down for an extended period," is out of proportion to the state of the art in minicomputer service today.

All good OEMs and third-party maintenance organizations stock the required amount of spare parts to bring the system back up within two or three hours.

Readers are urged to reply to this or any other Minicomputer Exchange article. This is your column, a chance for you to exchange views on the various topics confronting the minicomputer user, a chance to tell the vendors what you are thinking and to let your fellow mini users know about pitfalls or new techniques in this area. Letters or manuscripts should be addressed to Minicomputer Exchange, Computerworld, 797 Washington St., Newton, Mass. 02160. Double space, please.

If you have to spend the additional money and time to end up with a system as outlined in the last paragraphs of the article, then you are doing something wrong and defeating the purpose of minicomputers. If this is the case, perhaps you could buy a system from IBM and save money.

A few final thoughts on selecting your service company:

- A third-party maintenance company must be independent; it cannot be part of a parent company that manufactures computer products. Taking care of their own products will naturally have priority over taking care of you.
- A service organization cannot be responsible to a marketing division of a company.
- Selecting your maintenance team is as important as selecting your computer. Check the company to ensure they have the software and hardware maintenance capabilities you require.

Chilson is a consultant for the National Association of Letter Carriers Health Benefit Plan in Reston, Va.

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- 12:00-1:30 – Luncheon/Speaker: Leo J. Cohen: The Impact of Data Base on Menegement's Business.
- 1:30-4:00 – Four Concurrent Sessions

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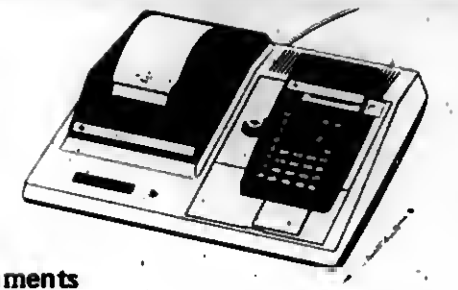

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Despite Institution Sizes

Oregon Hospitals Use Small Systems

PORTLAND, Ore. – Two hospitals in this metropolitan area have found they are able to use a small business system despite differences in their sizes, according to Robert W. Vial, director of fiscal services for both facilities.

The hospitals are separate and independent but geographically proximate nonprofit facilities, Vial noted.

Dwyer Memorial, located in Milwaukee, Ore., eight miles from here, is a 70-bed general acute-care hospital. Holiday Park Hospital, in downtown Portland, is a 195-bed acute-care facility.

On Vial's recommendation, each of the hospitals now has its own IBM System 32 and is using IBM's Hospital Financial Management System Industry Application Program (IAP).

Expectations Satisfied

"Results so far have completely fulfilled our expectations at smaller Dwyer Memorial and are equally pleasing at Holiday Park, which has two and a half times the bed capacity and patient volume," Vial said.

"Since the System 32 went in, business operations are more efficient, ancillary service revenues are higher, cash flow is swifter at Dwyer and financial controls are tighter at both hospitals," he reported.

Before the systems were installed, Holiday Park was posting patient records and billings manually. Dwyer Memorial was using a computer service for patient billings, accounts receivable and payroll processing.

Holiday Park Hospital only had computer service for payroll.

'Something Better' Needed

"By late 1974, it was apparent that something better in the way of DP systems was needed if we were to ensure the operating efficiency and gain the management control we wanted," Vial explained.

"Our initial aim was to find a single system that could be shared by the two hospitals, would be reasonably economical and capable of both automating basic hospital business routines and furnishing timely management information.

"However, when IBM announced the System 32 in January of last year, we found we could give each hospital its own in-house system at a lower cost than the single, shared system we had contemplated.

"Our only worry, which has since proved groundless, was that the System 32 might be too small to handle the larger hospital's heavier workloads," Vial recalled.

Conversion to the system was a bit more time consuming at Holiday Park than at Dwyer Memorial. But this had nothing to do with the differences in bed capacity and patient volume, according to officials.

Both On a Par

"We were converting from a total manual system, and had to build the necessary record files from scratch, while Dwyer Memorial already had created the record files for their computer service applications," Jerry Harley, Holiday Park's controller, explained.

Currently, both hospitals are on a par in implementation of the Hospital Financial Management System IAP. Patient billing, accounts receivable, accounts payable and payroll are up and running, and general ledger will go on the system shortly, according to Vial.

The patient billing program tracks patient transactions on a day-to-day basis, updates the records to reflect current status, captures all applicable charges and then provides necessary management information that was not available before.

"Service revenues have increased because a system of this type will pick up patient charges that might otherwise be missed in a manual system.

"Financial control is improved because of the timely reports the system provides, such as the aging analysis of accounts receivable and labor distribution analysis," Vial said.

At Dwyer Memorial, billings now get out within three days of the patient's discharge instead of up to 15 days with the old system.

Computer aging and reporting of overdue receivables also has a favorable impact on cash flow and the system is capable of accounts receivable agings on a variety of bases.

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Wangco Offers OEM Disk Drives

LOS ANGELES – Wangco, Inc. has introduced a series of OEM disk drives for minicomputers which are said to store 5M-, 10M- or 20M bytes of data in the space usually required for a 2.5M-byte drive.

Dubbed the "Super Generation," the drives are available in top-load Super T or front-load Super F models, the firm said.

The Super T uses an IBM 5540-type cartridge in combination with a fixed disk and offers data densities to 4,400 bit/in. with up to 200 tracks per inch for a total capacity of 20M byte/drive, the firm said.

The Super F, which uses IBM 2315-type cartridges, provides up to 2,200 bit/in. or 10M bytes of storage with transfer rates to 2,500K byte/sec, the firm added.

The reduced size of the drive is a result of a "side throw" voice coil positioning system, Wangco said. A magnesium positioner speeds access time so random average seek is 33 msec, the firm noted.

Other features include a filter forced air cleaning system, daisy chain and unit select capability of up to four drives as well as precise internal temperature compensation.

In OEM quantities, the 5M-byte unit costs $3,100; 10M-byte unit, $3,575; and 20M-byte unit, $4.470, the firm said from 5404 Jandy Place, Los Angeles, Calif. 90066.

IBM Adds Printer, Print Plot Library For 5100 Systems

ATLANTA – IBM has added another printer and a print plot/problem-solver library for use with the 5100 portable system.

The 5103 printer operates at 120 char./sec and is a 132-print-position matrix printer. It can handle single or multiple copies as well as continuous single or multipart paper, according to a spokesman.

With the library, users can use the 5100 with either the 5103 Model 1 or Model 2 printers as a plotting output device, he noted.

The library allows production of line graphs, histograms, bar charts and point-to-point plots. The graphs can be produced either from program-generated data or from data entered directly at the system's keyboard, IBM added.

Users can now use the 5100 with vector plotters and CRTs when a serial I/O adapter is added, he said.

The 5103 Model 2 costs $4,175. The library is available in either APL or Basic and costs $500, according to the spokesman.

Both will be available in November, he said from IBM's General Systems Division in Atlanta, Ga. 30301.

Small System Solves Large Business Woes

(Continued from Page 48)

Currently Burgess has several systems on-line with more to be developed, Peek noted.

The personnel information system was designed around an employee "master data set" containing general employee information and educational and training data as a subset, he said.

It provides information on an employee's work history including a specific list of skills, merit review data, vacation log, pension plan data and accounts for all the company-paid insurance benefits. This system also keeps track of all travel expense data.

The applications engineering systems are primarily used for product design and optimization. The system keeps track of Industrial Silencing vessel design including flow rate, noise and calculations by job or environmental specifications. Other products are also tracked by this system.

The bill of materials system allows design engineers to create families of parts, define a "standard" descriptive parameter hierarchy, generate hard copy of all possible parts and develop the physical bill of materials using standard descriptions.

The estimating system allows management to extend the bill of materials against "estimated, standard or average material costs" contained in the inventory data base.

An inventory control system tracks parts by job and location, consolidates purchasing for many jobs and processes bills of materials by job.

The corporate planning systems project sales by division seven years into the future and calculate gross margin nets of production fixed costs.

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CI Notes

Calcomp Realignment To 'Sharpen Focus'

ANAHEIM, Calif. – California Computer Products, Inc. (Calcomp) has realigned its major product elements into two main product line divisions.

A Graphics Products Division and a Memory Products Division have been created in order to "lend sharpened focus and direction to company efforts," according to George M. Canova, Calcomp president.

Each division will have its own engineering, manufacturing, quality assurance and product marketing responsibility, he added, with centralized operations already in place providing sales, field engineering and financial/administrative support.

H. Eugene Brewer has been named to head the Graphics Products Division while James Y. Payton will head the Memory Products Division.

Graphics Products will be responsible for all traditional graphics equipment such as plotters, plotter controllers and computer output microfilm systems, Canova said. Memory Products will focus on Calcomp disk and tape drives and controllers, the Automated Tape Library and related products.

Base, HIS Sign Agreement

NEW YORK – Base Information Systems, Inc., a subsidiary of Advanced Computer Techniques Corp., has signed a letter of intent with Honeywell Information Systems, Inc. (HIS) for a sales/service agreement.

Under the agreement, Base will offer its Ultratext System and the HIS Level 6 minicomputer as a packaged system.

Honeywell will acquire certain software license rights to the Base word-processing system and will provide installation and maintenance services to users.

Supershorts

TRW, Inc. plans to form a joint venture in France with Matra S.A. to distribute U.S. DP equipment marketed internationally by TRW Datacom International.

– – –

Memorex Corp. has named Moore Business Forms, Inc. as a distributor for three disk products: top- and front-load disk cartridges, IBM-compatible flexible disks and Data Mark data modules.

Measurement Revamped in '69

'Yardstick' Reduced IBM Market Share

By Edith Holmes
Of the CW Staff

NEW YORK – IBM may have sabotaged its own market share figures in the late 1960s because its management and legal counsel knew previous measurement policies revealed the corporation had a monopoly share, internal IBM documents suggest.

Introduced at the U.S. vs. IBM antitrust trial here, this group of some 32 documents, including the deposition testimony of six IBM executives, also indicate the corporation changed its methods for measuring its position in the computer industry at about the time the government filed suit in January 1969, the Justice Department hopes to show.

IBM counsel argued, however, that this effort to revise share figures, eventually called "Project Yardstick," was no more than an attempt to improve on IBM's field reporting system for learning about competitive successes and to include increasingly competitive products like communications devices, OEM equipment and add-on memories and other peripherals in its definition of the market.

IBM Trial Documents

As such, Yardstick was not created to answer the government's charge that IBM is a monopolist, the defense is maintaining.

The effect of Yardstick was to substantially lower IBM's estimate of its market share. Yardstick essentially broadened IBM's definition of that marketplace and caused the corporation to consider as its net position share only those machines it rented and therefore still owned, the documents show.

Using this scheme, IBM calculated its June 1969 standing as 48.7% of the market, for example, according to a September 1969 memo addressed to the IBM corporate director of marketing, then Ralph A. Pfeiffer.

"The erroneous old net position share for this time period would have been 71.2%," this document continued..

One document, entitled "Yardstick Very Net," sets out the chronology of IBM's use of competitive measurements. Written in part by Pfeiffer's administrative assistant, Donald Sisson, the exhibit indicates IBM's corporate vice-president of marketing, R.W. Hubner, first questioned the corporation's 85% market share in 1965.

To a man, those IBM executives asked about IBM measurements of competitive activity testified in depositions that IBM's field reporting system, called "Comstat" for "Competitive Statistics," was inadequate and unreliable.

Dependent on the sales force to report

(Continued on Page 54)

Cassette Seen Retaining Edge In Magnetic Recording Market

By Toni Wiseman
Of the CW Staff

WELLESLEY HILLS, Mass. – The cassette will retain its leadership position as the most popular low-cost magnetic data recording device through 1980, according to a recent study by Venture Development Corp. (VDC).

While predicting growth for cassettes, 3M cartridges and floppy disks, the study said cassettes, the lowest-priced medium in absolute terms, will continue to account for most units sold through 1980.

In 1975, cassettes accounted for 73% of the market for low-cost data recording devices, cartridges for 5% and floppies for 22%, according to the study. By 1980, cassettes will have 52% of the market, cartridges 8% and floppy disks 40%, it predicted.

"The world market for cassette drives will expand at a 16% annual rate through the next five years as the European and Japanese computer industries expand at a faster rate than U.S. markets (from a smaller base)," the report stated.

The average annual growth rate for foreign cassette markets will be 25%, VDC forecast, while the world market volume for 3M cartridge drives will increase at an average annual rate of 38% and floppies at a 40% rate.

The dominant medium remains the Philips-type cassette, VDC said, predicting the U.S. market for cassette drives will continue to grow at an average annual rate of 12% through 1980.

The 3M cartridge, which is the only other self-contained magnetic tape package to obtain industry acceptance, has had only limited success and has been unable to compete in the minicomputer-based applications market, according to VDC.

The floppy disk, on the other hand, is the cassette's principal competitor, "making considerable inroads in minicomputer-based applications," the study added.

"The digital cassette started with a bad reputation, but is beginning to live it down," the report said.

VDC found there are 20 producers of cassette drives who sell them on the open market; 10 more make drives for their own use. Less than half as many companies produce 3M drives as produce cassette drives, yet there are no large companies marketing cassette drives, VDC noted.

On the other hand, a number of large companies compete in the floppy disk business, VDC pointed out.

(Continued on Page 56)

Ansi I/O Standards Approaching Reality

WASHINGTON, D.C. – The proposed input/output interface standard based on IBM gear has moved a step closer to reality.

The American National Standards Institute's (Ansi) X3T9 technical committee has voted to forward the channel level and power control specifications to the user-oriented X3 committee as well as to the International Standards Organization, according to Del Shoemaker, X3T9 chairman.

The X3T9 group will now consider the operational characteristics of the interface for tape and disk drives as well as I/O terminals, he said.

Progress on this last item should move at a faster pace than on the previous two aspects of the standard, he said.

The X3 committee will poll its members

(Continued on Page 55)

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Despite '75 Revenues, FM Losing Early Glamour

WALTHAM, Mass. – Facilities management (FM) revenues totaled $415 million in 1975, about 13% more than its primary alternative, computer services, according to *EDP/Industry Report* (EDP/IR), published by International Data Corp. (IDC).

About 1.6% of total DP industry spending went for FM, EDP/IR said, noting an IDC study found the only major segment of the FM market destined to grow faster than the computer industry as a whole is that which specializes in industry-specific contracts.

Within that segment, the areas of most significant potential growth are the state and local government market and the educational market, it said.

"Although IDC expects FM growth to continue, at a modest 15% a year to $820 million by 1980, the industry has shed some of the marketing glamour it sported earlier in the decade," EDP/IR said. The newsletter noted:

- "Profits have provided difficult to achieve with increasing numbers of FM suppliers – including the one-time leader, Electronic Data Systems – moving to the shared computer, or data center, approach in efforts to maximize the revenue from each investment dollar."
- "Contract renewal rates are poor, forcing vendors to scramble for new customers just to maintain revenue levels. Many of the current users of FM interviewed by IDC had no plans to renew existing contracts."
- "The emergence of distributed processing with on-site minis for immediate processing requirements is beginning to look good to the suppliers of computer services, causing them to examine the merits of providing true FM services."

EDP/IR reiterated a statement it made three years ago, saying the quote still holds true: "The essential flaw in the classic FM concept is that DP is an integral part of a user's operation – unlike such tacked-on problems as feeding the employees or cleaning the halls.

"Though FM has proven to be an appropriate way to handle relatively standardized types of work in some fields – such as banking, insurance and government accounting – experience has also shown expertise in computing is no substitute for an intimate knowledge of a company's operations when it comes to running the DP department, EDP/IR said.

Three Submarkets

IDC distinguished three separate submarkets within the FM marketplace: Federal government FM; custom-commercial FM; and industry-specific FM, EDP/IR noted.

In 1975, the Federal government was the biggest buyer of FM services, spending $200 million or just under half of the total market revenue, according to IDC figures.

Growing Segment

This segment will continue to grow, but by 1980 will have dropped to 40% of the total market with revenues totaling $325 million, EDP/IR reported.

"Because of an expected slowdown in the emergence of new full-blown government computer installations and the entrenchment of civil service personnel at existing computer sites, FM business is expected to show slower growth than in the past," it explained.

Custom-commercial contracts, which accounted for $30 million in 1975, are also on the wane. By 1980, IDC predicted, this market will be only about $15 million.

The only real expertise an FM vendor can bring to the custom-commercial client is the ability to manage an efficient DP center and attract good people, EDP/IR said.

This accounts in great part for the decline of the market, since contracts are often not renewed once the center is running effectively.

This leaves only industry-specific FM as growth area. While these contracts are often as customized as custom-commercial ones, the vendor can take advantage of "learning curve" experiences which hold over from contract to contract, EDP/IR said.

In 1975, industry-specific FM revenues totaled $185 million, or 45% of the total market. IDC predicted that by 1980 this would grow to $480 million or 58% of the total.

CMI Lease Base Sold 'Over Book Value'

BEDFORD, Mass. – Cambridge Memories, Inc. (CMI) has consummated the previously announced sale by CMI's leading subsidiary of its lease base of add-on memories for a price "substantially over book value.

"The lease base sale was the most significant of several actions which we have planned for restoring CMI to a sound financial position," according to Joseph F. Kruy, CMI president.

The purchaser was Electronic Memories & Magnetics Corp.'s (EMM) Systems Equipment Division, a newly organized leasing company which will be managed by EMM.

CMI's present purchase base of over 500 installations will continue to be served and supported by CMI. The maintenance of the total equipment base will be performed by Raytheon Service Co. with support from CMI.

The sale discharged approximately $12.4 million of the CMI leasing subsidiary's debt, although the parent company has a contingent obligation to pay up to $1.5 million in mid-1980 to its lending banks if payments to the banks by the EMM's Systems Equipment Division do not meet certain levels, the firm said.

Total indebtedness to the lending banks, exclusive of the contingent obligation, has been reduced from about $17.2 million last July to approximately $1.9 million, CMI added.

CMI reported a loss of $1.9 million or $1.11 a share for its third quarter ended May 29 compared with earnings of $103,000 or 6 cents a share in the year-ago period.

Revenues in the quarter were $5.779 million compared with $5.777 million in the same period last year.

For the nine months, CMI suffered a $2.5 million loss compared with earnings of $251,000 or 15 cents a share in the year-ago period.

Revenues for the nine months were $17.4 million compared with $16.7 million in the corresponding period last year.

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Documents Show 'Yardstick' Cut IBM Market Share

(Continued from Page 52)

business lost to competition, Comstat partially relied on these people to report their failures to management. The series of transfers of this information from the branch and then the regional offices further decreased the accuracy of Comstat numbers, Pfeiffer said in his deposition.

In 1967, IBM attempted to adjust Comstat figures in hopes of making them more accurate, according to Sisson's memo. Corporate marketing and economics groups set up a model for adjusting statistics on the IBM 1620; funds for the project came from G.B. Beitzel, then president of the Data Processing Division (DPD). But, apparently, it went no further.

It wasn't until nearly two years later – in January 1969 – that the IBM director of business practices, F. Cummiskey, presented a definition of the "total information-processing market" to the corporation's Management Review Committee and was told to correct this definition where it was "deficient" in competitive information.

Started in 1968

In March 1968, Hubner formed a task force "to outline a workable and appropriate method of measuring and tracking business volume trends in the DP industry." This was Project Yardstick and, according to Sisson, it had the approval of top executives at the corporate and DPD levels.

Just a month later, IBM was called by the Justice Department to produce a statement on market power in the computer industry.

Sisson's memo stated this study "pointed out the need for changes" in measurement methods and noted IBM's outside counsel, Cravath, Swaine and Moore, and its in-house vice-president and general counsel, Burke-Marshall, "agreed changes were desirable."

Hubner directed Beitzel to implement broader market measurements as soon as possible and to include in the market definition competitive add-ons, terminals and control units and bookkeeping machines. Disk drives, disk packs and tape drives would be incorporated into these measurements later, Sisson reported.

"This new concept method is the way IBM's case is going to be presented in Washington," another document stated.

Rented Equipment Only

The plan which IBM's attorneys agreed to was based on its economists' contention that only rented equipment should be counted in IBM's measurement of its position.

Competitive equipment was to include not only machines made by other manufacturers, but IBM devices then owned by users and leasing companies as well, according to a memo to Hubner from Morton Zemen, corporate director of marketing analysis.

The IBM economists suggested the standard net position share contained "irrelevant information because it goes back too far in history and includes machines we no longer own," Zemen wrote. The economists also maintained this "ownership concept" would be a better means for calculating position share and that it need not conflict with the notion of "sales share," he added.

"From an economic and legal point of view, their definition might be accepted," Zemen told Hubner. "More important from corporate marketing's point of view is the possible requirement to put this concept to work to help run the business.

"Here I have severe reservations," Zemen continued. "It seems to me that we should completely abandon any kind of position share, rather than utilize their concept for marketing purposes.

"We could still have a sales share and gauge our progress in various areas by displaying the trend of this sales share over the past few years," he said.

Zemen was not alone in his reservations. Other documents from this time period indicate Hilary A. Faw, then director of corporate business practices, also believed position share data was best not mentioned.

And T.V. Learson, then corporate senior vice-president, expressed his dissatisfaction with the use of such figures in reports on IBM's position in various user industries.

Ten people and a budget of $500,000 were allocated to DPD to conduct Yardstick. Zemen presented Yardstick along with the plan to make sales share rather than net position share *the* market measurement to the Management Review Committee in October 1968, the documents show.

New competitive figures were to be available by August 1969. By 1970, all share figures for 1968 and 1969 conformed to this market measurement approach, Sisson's memo suggested.

Burroughs Developing 'Super' Processor

DETROIT – Burroughs has announced it is developing a "super" computer designed to handle the largest problem-solving requirements of science, industry and government.

"The system utilizes an array processor architecture which will enable it to complete vector-oriented problems at speeds in excess of any system currently installed or believed to be under development," Burroughs Chairman Ray W. Macdonald said.

"The system is ideally suited for large-volume vector- or parallel-oriented problems which are often found in such applications as structural analysis, nuclear research, natural resource exploration, meteorology and econometric modeling."

The computer uses a large-scale integrated circuit implementation of Burroughs Current Mode Logic. It will use the large-scale Burroughs B7700 as its systems manager, and the total systems environment will be controlled by Burroughs Master Control Program (MCP).

The scientific processor will be programmed exclusively in Fortran under full MCP control, using a vectorizing compiler which converts frequently used serial Fortran instructions into vector operations, Burroughs said, adding this software approach is believed to be unique for this class of computer system.

The scientific processor is being developed at Burroughs' Great Valley Laboratories near Philadelphia. Delivery of the system is planned for the fourth quarter of 1978.

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Leading data communications industry organizations have joined forces to make DATACOMM 77 the national focal point for the datacomm community. Conference organizers are the Association of Data Communications Users, Auerbach Publishers, Canadian Datasystems, Computer Decisions, Computerworld, DataComm User, Datamation and Infosystems.

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'Lay Everything on the Table'

Openness Urged on Executives Negotiating Mergers

TORONTO – Executives participating in mergers and acquisitions should be completely honest with each other and lay everything on the table at the outset, according to Gilbert Mintz, president of Broadview Associates, Inc.

Mintz spoke at a recent Association of Data Processing Service Organizations meeting here where attendees were interested in the specific procedures and dos and don'ts of acquisitions rather than in the implications to their industry of future consolidation.

Bernard Goldstein, vice-president for corporate development at Tymshare, predicted by the late 1980s there will be 10 to 12 firms in the services arena each with annual revenues of $250 million.

These will have 50% of the total industry revenues, he told a session on "The Impact of Consolidation on the Industry."

That picture is not meant to be discouraging, Goldstein said, noting the smaller entities will operate on a local basis.

His vision shows the computer services industry does not accommodate itself to a monopoly, he observed.

The prime impetus toward the emergence of these large firms will be the economies of scale in hardware, communications and marketing, he said, adding the trend toward growth and toward being a multiservice vendor increases a firm's need for capital.

Along with the drive to growth comes the incentive for diversification as a move to prevent susceptibility to a "negative external event" such as federal legislation and IBM actions, Goldstein said.

"IBM by mistake can adversely affect any single market, to say nothing of what it can do through an aggressive act," he added.

Mintz explained the deficiencies in the public market are providing incentive for companies to acquire their growth through mergers since they cannot easily get sufficient capital from the investment route.

In urging complete communication between the buyer and the seller, Goldstein said both parties are going through a schizophrenic phase and no one listens to anyone else during negotiations.

However, when the dust settles, there can be some rude awakenings if items were not outlined clearly in advance. Chief executives should disclose at the outset whether they want to cash in or to stay, he said. "You must be honest; it's an ongoing relationship," Mintz remarked.

"Merger" is largely a euphemism for "acquisition," he said. In nearly all cases, one is the acquirer and the other the acquiree, he added.

However, he doesn't like to use the term "acquire" because it "makes someone feel like a lambchop."

Difficult Lesson

A lesson learned the hard way by Jack Roseman of On-Line Systems, Inc. is not to peg the sales price of a firm on future stock prices.

One must take a very close look when acquiring a software company because the assets "drive out every night," one attendee said.

John D. Morand, director of corporate development at Comtech, suggested looking at the individuals running the firms, the systems analysts and programmers and their relationship with the head man when deciding whether to acquire a firm.

One key factor is the documentation of a system. If it is not up to a point where someone else can maintain and modify the system, "then you're probably talking $60,000 to $70,000 per system to get it up to that point," he said.

Looking to the future, when he sees new CPUs with operating systems in the firmware, Morand said one should consider whether the firm is in the applications or systems area.

Also, what are the core requirements of the products? Can they be adapted to other systems – and specifically to minis? What are maintenance revenues? he asked.

Bruce Coleman of Boole & Babbage suggested the longevity of people could be lengthened if they were provided opportunities for working in new technological areas with new resources.

Jack Roseman of On-Line Systems suggested a software company might think its acquirer attractive if it offered computer facilities because many rent development time on outside machines.

However, another attendee warned of programmers' insatiable need for machine time. Service companies pondering whether to offer spare time should decide to do so only if they have a lot of spare time during the day they are willing to devote to in-house development work, he remarked.

Ansi I/O Standards Approaching Reality

(Continued from Page 52)

on whether the proposed standards should be submitted to them in a letter ballot and also be made available for public review, he said.

During the four months the standard will be out for review and X3 will collect comments and refer them to X3T9, Bob Brown, vice-chairman of X3, explained.

When the final ballot is sent out, X3 will include these comments and the technical committee's replies, he said.

If adopted and adhered to, peripherals attachable to IBM mainframers would also be compatible with other mainframers' CPUs, Jack Biddle, executive director of the Computer and Communications Industry Association, observed.

Adherence to Ansi standards is voluntary on the part of the manufacturers. Much opposition from mainframers is expected during the review by X3, he said.

X3 includes about 46 members; 16 mainframers and other manufacturers; 16 user organizations and 14 general-interest societies, Brown said.

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Cassettes to Hold Edge in Magnetic Recording Mart

(Continued from Page 52)

"We believe there is an opportunity for a large, stable company to enter the cassette market, possibly by acquisition, and dominate it. Certainly, this is a more promising area than floppy disk drives, already overcrowded with large companies," the report said.

Presently, the study observed, the market for cassette drives is about 55% captive, but will decrease to slightly under 50% by 1980.

Most of the largest users make their own drives, and ICP is the only independent cassette drive manufacturer in the U.S. that sells drives in quantities comparable to the internal production of the large users, VDC said.

Figures for 1975 will show a total of 172,000 cassette drives, 10,500 cartridge drives and 52,000 floppy disk drives shipped, according to the report.

By 1980, cassette drive shipments will grow to 366,000, cartridge drives to 52,500 and floppy disk drives to 276,000, VDC estimated.

Slower Pace

VDC found the cassette drive market is no longer in rapid flux. "Users of drives are generally satisfied and are not looking for the better mousetrap. Once designed in, the mechanical and electrical complexity of the interface tends to prevent the user from changing to another drive in future product revisions," the study reported.

There is, however, a booming cassette media market. Growth wes projected at an average annual rate of 28% per year through 1980.

Although the growth rate will slow to 18% per year in 1980, the volume of sales will be $54 million, up from a 1975 volume of $16.7 million, the report said.

The market for data terminals constitutes the largest segment of cassette use, closely followed by small business systems. Together they account for 60% of the market.

3M Cartridges

The 3M cartridge was originally aimed at minicomputer-based equipment because it has a better access time than the cassette, but the floppy has a data retrievel rete at least an order of magnitude faster than the 3M cartridge.

Standards for information interchange have been prepared by the American National Standards Institute (Ansi) for cassettes and 3M cartridges.

"The physical standards for the cassettes and cartridges have been accepted readily. The formatting specifications of the original cassette standard have been widely disregarded," VDC stated.

"A second standard using two-channel speed-independent code is in the process of approval, but it will be similarly ignored," the report predicted. "There is no single large user such as IBM to impose de facto standards by requiring industry to interface to its products."

Floppy disk standards are now being worked on by Ansi and will specify IBM compatibility, the report forecast.

The 3M cartridge (phase-encoded, 1,600 bit/in.) standard was accepted by the industry without dissent, but it is not always adhered to because its lower recording density can reduce costs and improve reliability, the report stated.

Sales of 3M cartridge drives will show figures of $5 million in 1975, or 1/13th the size of the cassette market, the study said. The market will grow to $8.5 million in 1980 from a small base.

The 3M Co. manufactures most of the cartridges and provides license agreements to at least one other supplier, Information Terminal Corp.

In spite of competitive technologies, cassette drive usage is increasing in absolute numbers, but floppies are gaining a larger share of the market for data recording in general-purpose minicomputer applications, intelligent terminals and small business systems wherever fast access is important, the report said.

DP Balance of Trade Continues Favorable

WASHINGTON, D.C. – Computers and related equipment accounted for 85% of total business machine exports during the first half of 1976, according to the U.S. Department of Commerce.

U.S. business machines in general showed a favorable balance of trade amounting to $870.6 million, e 1% increase over the first half of 1975, Commerce said.

Imports of computers and related equipment rose 31% to $83 million, while exports rose to $1.2 billion, up 11% from the year-ago period.

Canada once again was the biggest customer for U.S. computers, purchasing exports valued et $182.2 million, according to Commerce figures.

The Federal Republic of Germany followed with $149.3 million; the UK with $136.1 million; France with $133 million; and Japan with $108.5 million.

Key Tronic Files Suit

SPOKANE, Wash. – Key Tronic Corp. has filed a lawsuit in the U.S. Federal Court in Seattle, against Controls Technology Corp., doing business as Controls Development Corp. and Automix Keyboards, Inc.

The lawsuit seeks to secure a judgment that Controls Development has no claim against Key Tronic for alleged patent infringement and that the patent issued to Controls Development for a push-button capacitive switch is invalid and unenforceable.

The suit also seeks an injunction against Controls Development from threatening Key Tronic or its customers with infringement or lawsuits in using Key Tronic's capacitor switch in its keyboards.

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Financial News

Security Analysts Told

Honeywell Bull-CII Merger Advantageous

NEW YORK – The French computer merger of Honeywell Bull with Compagnie Internationale pour l'Informatique (CII) will significantly reduce the debt level of Honeywell, Inc. and substantially improve its debt-to-capitalization ratio, security analysts were told here recently.

The transaction was completed June 30, 1976 and was reflected in Honeywell's third-quarter earnings report issued Oct. 13.

At the time of the merger, Honeywell's interest in Honeywell Bull changed from 66% to 47%, according to James H. Grenell, vice-president and corporate controller.

Consequently, Honeywell's share in the earnings of the merged company, starting in the third quarter of 1976, were reported on an equity basis instead of on the consolidated basis previously used for Honeywell Bull.

Prior periods have been restated in order to present consistent comparative operating statements, he added.

Grenell pointed out that restating the financial performance of Honeywell Bull on an equity basis resulted in no change in prior years' earnings or earnings per share, although the sales revenues, costs and expenses of the French company will no longer be included with those of Honeywell.

Louis E. Navin, vice-president and corporate treasurer, said the most significant effects of the restatement were to reduce Honeywell's total 1975 debt by more than 38% and reduce the debt-to-capitalization ratio in 1975 from 37% to 28% – with no change in stockholders' equity, according to Navin.

Clarence W. Spangle, president of Honeywell Information Systems, cited the following additional benefits of the merger: a substantially larger share of the French computer market; plans of the French government to purchase approximately $800 million worth of computer equipment from CII-Honeywell Bull in the next four years, plus subsidies from the French government of approximately $240 million to be applied to research and development and transition costs of the merger in the next four years; increased R&D capability; strong involvement by Compagnie Generale d'Electricite, a shareholder in the merged French company; a cash payment to Honeywell of $58 million that was above book value and yielded a $12 million net capital gain.

Setting the stage for a discussion of some of Honeywell's future plans, Spangle reviewed a series of events beginning six years ago when Honeywell merged its general purpose computer business with that of General Electric (GE).

In the ensuing years, Honeywell has concluded an arrangement with Xerox to manage its worldwide computer base, formed a joint venture with Control Data Corp. to develop and manufacture peripheral devices and concluded the French merger forming CII-Honeywell Bull, according to Spangle.

"We have expanded our installed base and our revenue stream threefold since the GE merger. We have a product capability in place to protect this investment," he said.

"We have achieved a level of line unification that serves our users' needs and we have accomplished acquisitions, consolidations and economies that have improved our cash position. We have a solid financial foundation," he noted.

One of Honeywell's major goals is to establish itself as an industry leader in the high-growth field of computer networking and distributed processing, Spangle told the analysts.

"In the near future," he added, "we intend to launch our Series 60 computer family on an aggressive path that will continue to support our installed base but also will make Honeywell the logical choice for any computer user interested in implementing advanced networking and distributed processing applications.

"We will capitalize on our current Series 60 strength and reveal new functionality to help our users expand. We think we have developed a unique approach, integrating our minicomputer line and our general purpose computer systems."

National Semi Net Falls in Quarter

SANTA CLARA, Calif. – National Semiconductor Corp.'s earnings fell in the first quarter despite increased revenues.

Earnings for the first quarter ended Sept. 19 were $3.3 million or 25 cents a share compared with $5.2 million or 40 cents a share a year ago.

Revenues for the quarter rose 36% to $112.1 million from $82.4 million in the year-ago quarter.

The first-quarter sales gain was due to a heavy increase in semiconductor demand which began at the end of last year, according to Charles E. Sporck, president.

He added that while the decline in profits was disappointing, it was not unexpected because of previously disclosed problems in digital watch die and module assembly, which have since been solved.

"Steady progress is being made and sales will be less affected by the watch die problem during the second quarter than in the first," Sporck noted.

"We still expect that net earnings for National's entire fiscal year will be above the $1.44 per share level reported for fiscal 1976 because of correction of the watch situation and the fact that all other facets of the company – semiconductor and supermarket point-of-sale – are performing well," he said.

Incoterm Net Down in Six Months

WELLESLEY HILLS, Mass. – Incoterm Corp.'s earnings dropped both for the second quarter and for the six month period due largely to a higher federal income tax rate.

Earnings for the second quarter were $556,079 or 28 cents a share compared with $585,009 or 29 cents a share in the year-ago period.

Revenues rose to $8.9 million from $8 million a year ago.

For the six months, earnings dropped to $912,294 or 46 cents a share compared with $1.3 million or 65 cents a share including a $193,000 tax credit.

Revenues were $17.1 million, up from $15.6 million a year ago.

Backlog at the end of the second quarter was $27.5 million, up 67% over the second quarter a year ago and 32% over fiscal 1977's first quarter.

During the second quarter, the company completed negotiations for the external financing of a short-term rental program to be offered to customers in the U.S. and the UK.

Nickels & Dimes

Measurex has exercised its option to extend the maturity on a total of $5 million of subordinated promissory notes held by the Massachusetts Mutual Life Insurance Co. and MassMutual Corporate Investors, Inc.

$ $ $

National CSS has declared a 5-cent quarterly dividend payable Dec. 1 to holders of record Nov. 15.

$ $ $

Centronics declared a quarterly dividend of 20 cents payable Jan. 3 to holders of record Nov. 30.

$ $ $

Nashua has declared a 17-cent quarterly dividend payable Dec. 3 to holders of record Nov. 19.

$ $ $

Lynch Communications has declared a 7-cent quarterly dividend payable Nov. 15 to holders of record Nov. 2.

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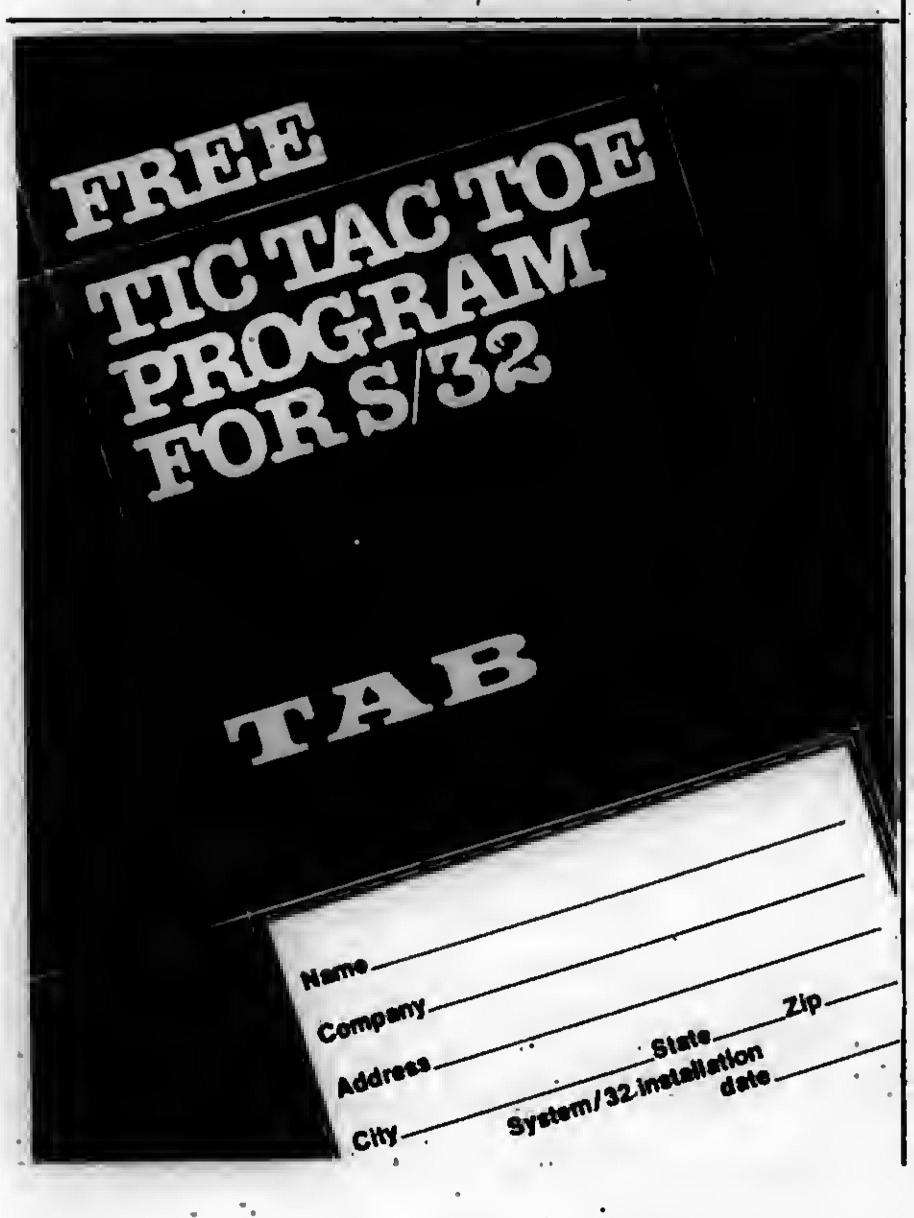

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And Hurting Employment

Decline in R&D Seen Stunting U.S. Economic Role

CHICAGO – If the decline in research and development (R&D) investment by the U.S. is not reversed, it could seriously affect the nation's economic leadership and our ability to provide the 18 million new jobs that must be generated in the next 10 years, according to Dr. Thomas A. Vanderslice, vice-president and group executive of General Electric's Special Systems and Products Group.

In addition to the nation's ability to compete in the world marketplace, the pace at which it can develop new advances in energy sources, materials and many other fields which are vital to American economic growth and its people are also at stake, he said here recently.

In spite of the strong position we currently enjoy, "there are many – economists, scientists, representatives of government, industry and the academic community – who believe the facts show that technological innovation in this country is approaching a critical point," Vanderslice stated.

He cited several trends indicating an erosion of U.S. technological leadership.

The 25 years following World War II saw some of the most dramatic commercial innovations in history – stemming at least in part from the R&D of the '40s: computers; the transistor and integrated circuits; radar; communication, weather and navigational satellites, he noted.

For most of this period, the U.S. had a comparative advantage in new and improved products and processes, an advantage that has continued to the present in agricultural and so-called high-technology products, he asserted.

"For example, one study showed that of some 500 major technological innovations introduced into the commercial market between 1953 and 1973 by the major industrial countries, the U.S. led by a wide margin, Vanderslice noted.

"However, the U.S. lead declined from the late 50's to mid-60's, falling from 82% to 55% of innovations. The slight upward bleep at the end of the line does not represent a gain for us, but further decline for the UK, vis-a-vis the rest of the industrial world.

"The largest actual gains, as might be expected, were recorded by Japan and West Germany," he said.

Patents show the same kind of trend, with U.S. patents granted to foreign inventors more than doubling from the '60s to the 70's. The favorable balance with Japan had declined steadily since 1962, as its patenting of inventions in the U.S. increased some three-fold, he added.

"With the rich heritage of technical competence resident in our labor and managerial forces, it may seem strange to say that U.S. technology is in trouble today.

"Yet, I believe, there are trends that, unless corrected, could lead to a rapidly maturing crisis, such as the UK is now undergoing in translating her technology into economic growth. This is a road we dare not go down," he stated.

Budget Allocations

R&D has been well nourished in the U.S. But in recent years, R&D has been suffering from malnutrition – and it may be suffering not just from a lack of federal and corporate calories, but also from an imbalanced diet.

In the U.S., the percent of gross national product (GNP) devoted to R&D has dropped steadily for more than nine years. Meanwhile, other countries have registered substantial gains.

Underlying the gains of Japan and West Germany were continuous large increases in funding from both industry and government, according to Vanderslice.

R&D is a comparatively small part of the total federal budget. It is also apparent that while total federal outlays approximately doubled between 1965 and 1975, approaching $400 billion, R&D remained relatively constant.

The share of the federal budget represented by R&D and by R&D plant programs has declined continuously from 1965, not even keeping pace with inflation, he said.

Corporate spending for R&D, on the other hand, has just about managed to keep pace with inflation, remaining nearly constant for most of the period at around 1% of the GNP while federal R&D spending has dropped from almost 2% of the GNP in 1966 to an estimated 1.2% in 1976.

The record suggests American industry more fully recognized the value of maintaining constant, continuing levels of support for R&D, than has the Federal government, Vanderslice noted.

"In the long run, I can think of nothing that can give more leverage on all of the problems that confront us now and in the future than to protect the 'seed corn' of scientific and technological competence that resides in our universities, industry, government in-house and privately funded organizations," Vanderslice said, emphasizing the amounts of money involved would be modest compared to other items in the federal budget.

In products with low technical content, the U.S. trade balance dropped from a breakeven point in 1960 to a $16 billion deficit, he said. At the same time, high-technology product exports were up to a plus of over $25 billion per year.

"High-technology companies appear to have a growth rate about double that of low technology companies and create jobs five times as fast," he said.

Renewed emphasis on U.S. technology, he said, "would create 'new' jobs for the scientists and engineers, who in the larger sense create not only their own jobs but jobs for hundreds and thousands of others."

Number of Scientists Decline

Vanderslice pointed out that the number of scientists and engineers engaged in R&D per 10,000 population had declined from the late 60's to the present. The U.S. is the only major industrial nation in which this indicator declined over this period.

"The free and exuberant atmosphere of technical innovation that sustained research and engineering in the 50's and 60's has disappeared as we seem to be heading toward a nation in which the number of people able to articulate the problems will be greater than the number of people capable of solving them," he asserted.

He warned that "much of what we expect science and technology to provide in the future, requiring new understandings and inventions will, in the opinion of many in the scientific community, be slower in coming unless present trends are reversed."

Dr. Dixon Doll will show you how to plan and manage effective data communications systems.

Data communications has become a focal point for new growth, and new economies, in computer use. But there are many hazards for the user. Even many up-and-running systems have costly flaws that can be improved through better management methods. And that's where these seminars come in.

Computerworld has sponsored Dr. Dixon Doll's two seminars on data communications because step-by-step, they give you the practical information you need to evaluate data communications networks and use them effectively.

1. **Data Communications Course #1010 — Practical Data Communications Systems and Concepts.** Led by Dr. Dixon Doll, this two-day seminar is designed for people who are relatively new to data communications. It presents you with a comprehensive exposure to the important terminology, economic aspects, and functional characteristics of contemporary data communications devices, techniques and systems. Money-saving ideas are an important part of this seminar, and you will see how to implement them using innovative techniques like split-stream modems, diagnostics for fault isolation, modem-sharing devices and digital bridges, remote multiplexers/concentrators, and front-end preprocessors. The seminar will focus on the latest developments in data communications, such as SDLC, IBM's new Synchronous Data Link Control, DDS, Bell's new digital data network, and HID-LoD, Bell's newly effective tariff for voice lines. And we'll look at the impact of satellite carriers and specialized carriers as well. This seminar will give you the ability to recognize and solve specific problems in data communications so that you can effect cost savings and performance improvements at your installation.

2. **Data Communications Course #1020 — Advanced Teleprocessing Systems Analysis and Design.** Course 1020 will give you an in-depth familiarity with techniques for planning, designing and managing cost-effective commercial data communications networks. Class study and discussion of specific telecommunications problems affecting your organization is an important part of this three-day seminar, and you'll have the opportunity to present such problems for analysis by the instructor and class members. You will also participate in project teams assigned to individual data network case studies, and you'll see what approaches have been taken by other organizations with networking problems similar to your own.
Like Course 1010, this seminar will focus on recent developments in data communications. But Course 1020 will concentrate on greater depth and detail. It assumes that attendees are already involved with and experienced in data communications networks, and that they desire very detailed knowledge in the field. Emphasis will be placed on thoroughly examining contemporary cost-reduction networking ideas, along with specific procedures for implementing them. Design problems associated with terminal selection and line organization will be addressed in detail as they apply to recent developments like SDLC, satellite transmission and integrated multiapplication nets. Algorithms for determining line speeds, number of ports the optimum mix of WATS and DDD for switched nets will also be examined. This seminar will give you the ability to perform your own design calculations, and it will enable you to recognize areas in present (or proposed) systems where cost savings are possible. And you will gain practical mastery of the techniques you need to realize these savings.

Dr. Dixon R. Doll is the Seminar Leader

Dixon R. Doll received his B.S. degree in Electrical Engineering (Cum Laude) from Kansas State University, and as a National Science Foundation Scholar he received his M.S.E. in Electrical Engineering and PhD in Systems Engineering from the University of Michigan. Dr. Doll has extensive experience with equipment vendors and users. He is the principal architect of the Communications Network Configurator, a family of computer programs used by the Raytheon Data Systems Company to design and analyze end-user computer-communications networks. As Head of DMW Telecommunications Corporation, which he founded, he designed Household Finance Corporation's North American Orbit network, involving more than 2700 terminals and 10 concentrators throughout the U.S. and Canada. He has developed teleprocessing network analysis software for many other major organizations, including Burroughs Corporation, IT&T, MCI, Procter & Gamble, Sun Oil, Texas Instruments and VWR Scientific Corporation. He is also a visiting staff member at the IBM Research Systems Institute in New York, where he teaches courses on data communications fundamentals, teleprocessing network design and resource sharing computer networks. Dr. Doll, a founder and Technical Director of the International Communications Corporation's ICC Institute in Miami, will lead the entire seminar.

Charges and Enrollment

The charge for Course 1010, a two-day seminar, is $350 per registrant, and $300 for additional registrants from the same company. The charge for Course 1020, a three-day seminar, is $450 per registrant, and $400 for each additional registrant from the same company. Both seminars include continental breakfasts, luncheons and all course materials at no extra charge. Hotel rooms, if necessary, are not included, but we have reserved space at the seminar hotels for attendees who wish them.

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Earnings Reports

ADDRESSOGRAPH-MULTIGRAPH
Year Ended July 31

	1976	a1975
Shr Ernd	$.80	$.78
Revenue	572,920,000	584,246,000
Earnings	6,431,000	6,257,000
3 Mo Shr	.35	.44
Revenue	157,626,000	155,051,000
Earnings	2,781,000	3,497,000

a-Restated for foreign currency translation.

ADVANCED SYSTEMS
Year Ended Mar. 31

	1976	1975
Shr Ernd	.....	$.42
Revenue	$8,962,352	8,346,282
Earnings	a(16,333)	431,194

a-Reflects $473,191 in pretax write-offs.

AMDAHL
Three Months Ended Sept. 24

	1976	a1975
Shr Ernd	$.99	.....
Revenue	26,045,000	.....
Tax Cred	3,302,000	.....
Earnings	6,898,000	.....
9 Mo Shr	1.69	.....
Revenue	52,336,000	.....
Tax Cred	4,775,000	.....
Earnings	9,972,000	.....

a-Operations began in fourth quarter of 1975.

AMERICAN MICROSYSTEMS
Three Months Ended Oct. 2

	1976	1975
Shr Ernd	.....	$.02
Revenue	$17,571,000	17,285,000
Earnings	(1,929,000)	46,000
9 Mo Shr	.....	.21
Revenue	49,606,000	48,644,000
Earnings	(11,078,000)	461,000

APPLIED DIGITAL DATA SYSTEMS
Three Months Ended Aug. 31

	1976	1975
Shr Ernd	$.33	$.23
Revenue	6,146,013	4,676,408
Earnings	1,249,072	861,174
9 Mo Shr	.86	.57
Revenue	16,558,415	11,825,967
Earnings	3,273,172	2,136,278

AUTOMATIC DATA PROCESSING
Three Months Ended Sept. 30

	1976	1975
Shr Ernd	$.33 a$.26	
Revenue	53,020,000	41,283,000
Earnings	4,608,000	3,589,000

a-Adjusted for June 1976 two-for-one stock split.

BOLT, BERANEK & NEWMAN
Three Months Ended Sept. 30

	1976	1975
Shr Ernd	$.05	.....
Revenue	8,914,500	$7,460,200
Earnings	68,000	(112,100)

BOOTHE COMPUTER
Three Months Ended Sept. 30

	1976	1975
Shr Ernd	$.31	$.05
Revenue	15,095,000	10,494,000
Disc Op	.....	(275,000)
Earnings	1,102,000	205,000
9 Mo Shr	.77	1.08
Revenue	41,707,000	30,197,000
Disc Op	.....	(220,000)
Spec Cred	.....	a3,775,000
Earnings	2,852,000	4,206,000

a-Gain from extinguishment of debt.

BUNKER RAMO
Three Months Ended Sept. 30

	1976	1975
Shr Ernd	$.34	.....
Revenue	77,203,000	$70,284,000
Tax Cred	330,000	.....
Earnings	2,615,000	(2,362,000)
9 Mo Shr	.65	.....
Revenue	241,767,000	218,473,000
Tax Cred	1,680,000	.....
Earnings	5,709,000	(1,897,000)

BURROUGHS
Three Months Ended Sept. 30

	1976 (000)	a1975 (000)
Shr Ernd	$.92	$.83
Revenue	443,235	367,712
Earnings	37,188	32,779
9 Mo Shr	2.58	2.41
Revenue	1,312,808	1,149,815
Earnings	103,928	95,287

a-Restated.

CALIFORNIA COMPUTER
Three Months Ended Oct. 3

	1976	1975
Shr Ernd	$.08	.....
Revenue	30,513,000	$26,655,000
Earnings	267,000	(3,224,000)

CENTRONICS DATA COMPUTER
Three Months Ended Sept. 30

	1976	1975
Shr Ernd	$.57	$.45
Revenue	12,835,511	11,202,565
Earnings	2,781,030	2,142,802

COMPUSCAN
Three Months Ended Aug. 31

	1976	1975
Shr Ernd	$.11	$.21
Revenue	3,102,000	2,796,000
Tax Cred	.....	149,000
Earnings	259,000	341,000

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The department has a PDP 11-40 based graphics system and a PDP 11-20 system. A DEC-10 and a DEC-20 system are available for general university-wide use. Please send resume to: R.P. Banaugh, Department of Computer Science, University of Montana, Missoula, Montana 59801. (406) 243-2883. An equal opportunity and affirmative action employer.

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Below are some of our more immediate needs. Karen Daly would like to hear from you at Amdahl Corporation, 1250 East Arques Avenue, Sunnyvale, California 94086. To expedite your application, please indicate on your resume the specific postion you are responding to in this ad. We are, of course, an equal opportunity employer.

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Salaries for ell positions are commensurate with experience, benefits are excellent and responsibilities will bring high visibility and the potential for further career advancement.

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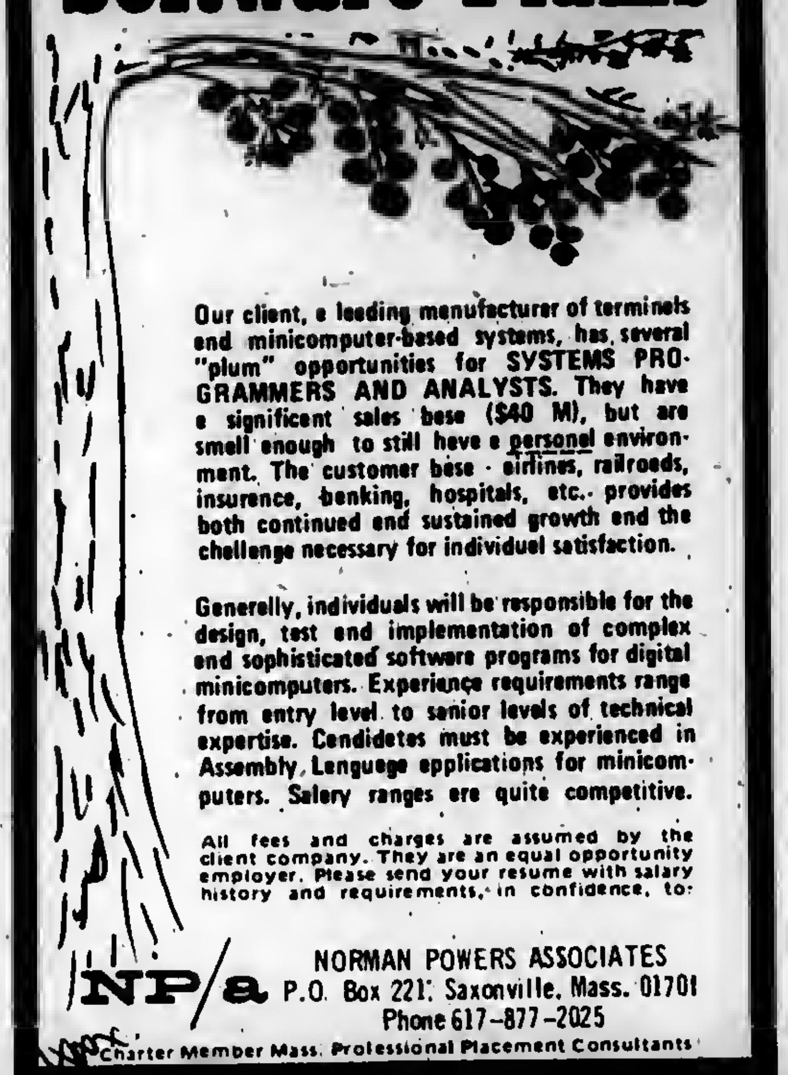

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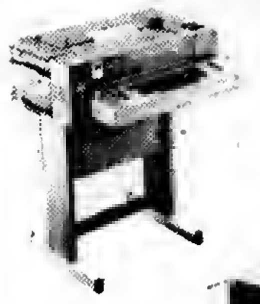

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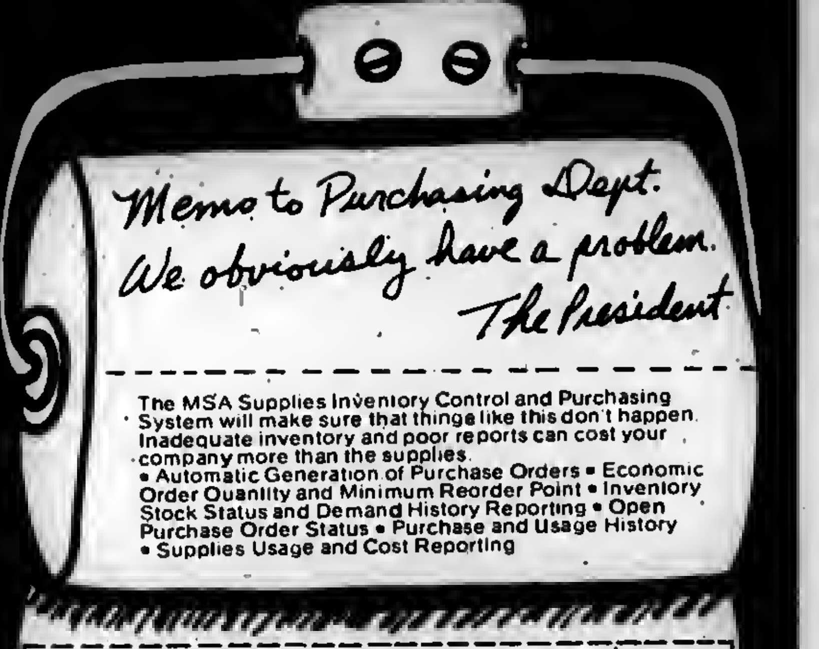
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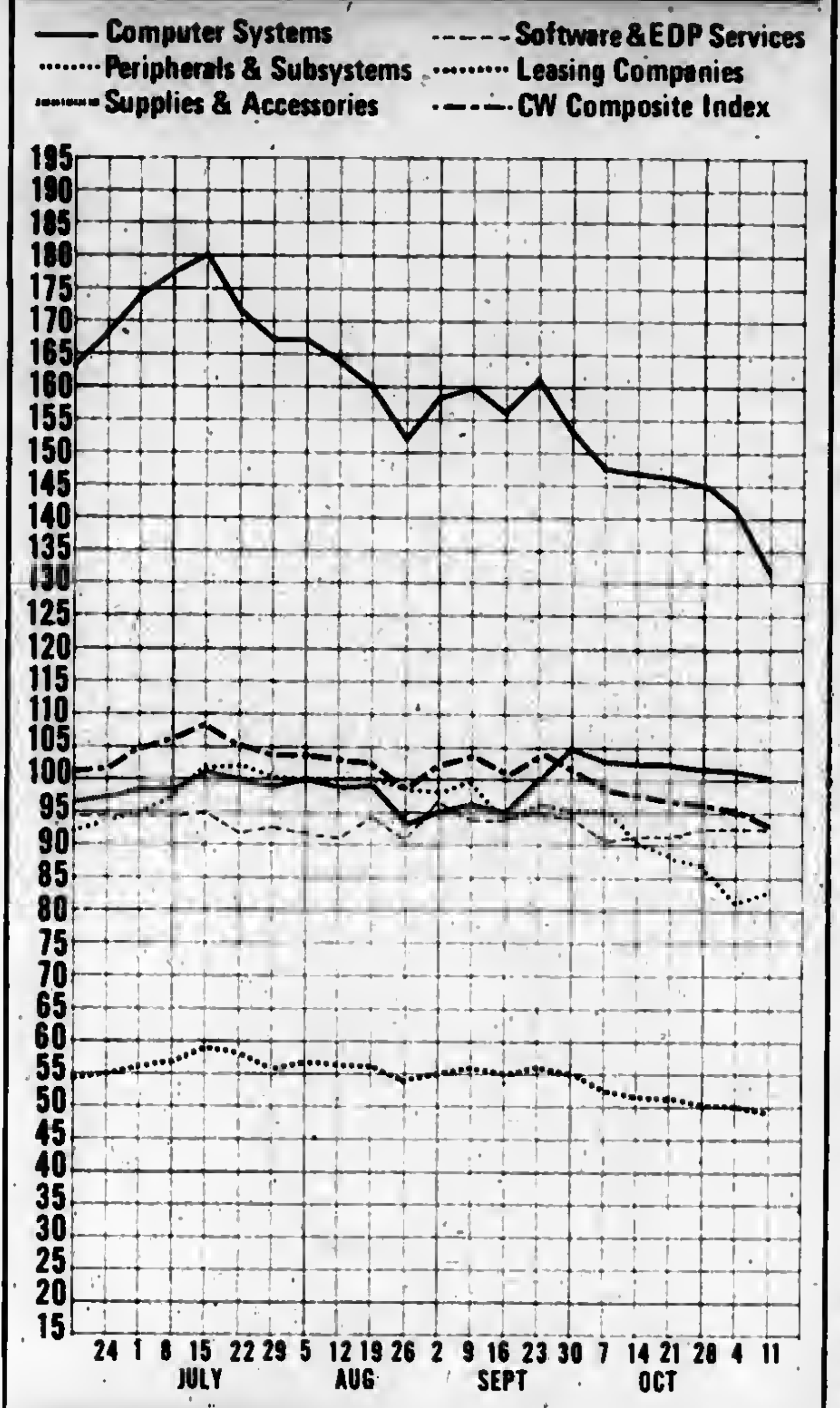
COMPUTERWORLD Computer Stock Trading Indexes



Earnings Reports

PRIME COMPUTER
Three Months Ended Oct. 3

	1976	1975
Shr Ernd	$.29	$.10
Revenue	6,011,000	2,994,000
Tax Cred	351,000	111,000
Earnings	676,000	202,000
9 Mo Shr	.65	.20
Revenue	14,777,000	7,910,000
Tax Cred	726,000	212,000
Earnings	1,484,000	411,000

RECOGNITION EQUIPMENT
Three Months Ended July 31

	1976	1975
Shr Ernd	$.21	$.12
Revenue	15,580,000	13,465,000
Tax Cred	388,000	224,000
Earnings	1,215,000	733,000
9 Mo Shr	.71	.36
Revenue	48,841,000	42,477,000
Tax Cred	1,455,000	965,000
Earnings	4,183,000	2,082,000

SANDERS ASSOCIATES
Year Ended July 30

	1976	1975
Shr Ernd	$1.20	$3.27
Revenue	198,286,000	180,936,000
Tax Cred	1,950,000	a13,411,000
Earnings	5,715,000	14,945,000
3 Mo Shr	.45	.12
Revenue	51,099,000	51,601,000
Tax Cred	809,000	169,000
Earnings	2,148,000	546,000

a-Includes $7,889,000 from debentures exchange.

MINI-COMPUTER SYSTEMS
Three Months Ended July 31

	1976	1975
Shr Ernd	$.33	$.08
Revenue	2,357,000	1,137,000
Tax Cred	.....	3,000
Earnings	226,000	54,000
9 Mo Shr	.85	.52
Revenue	5,910,000	3,157,000
Tax Cred	.....	98,000
Earnings	563,000	325,000

WYLE LABORATORIES
Three Months Ended July 31

	1976	1975
Shr Ernd	$.31	$.11
Revenue	36,451,000	29,476,000
Earnings	1,040,000	369,000
6 Mo Shr	.58	.23
Revenue	71,618,000	58,468,000
Earnings	1,925,000	750,000

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, NOVEMBER 10, 1976

All statistics compiled, computed and formatted by
TRADE★QUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		1976 RANGE (1)	CLOSE NOV 10 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	AMDAHL CORP	23- 30	25 1/2	+ 1/4	+0.9
N	BURROUGHS CORP	84-108	85 1/2	-4 1/8	-4.6
O	COMPUTER AUTOMATION	10- 19	14 3/8	+ 1/4	+1.7
N	CONTROL DATA CORP	18- 27	21 5/8	-1 7/8	-7.9
N	DATA GENERAL CORP	40- 60	43 1/2	+1 1/8	+2.6
O	DATAPOINT CORP	24- 46	23 1/2	-2 1/2	-9.6
O	DIGITAL COMP CONTROL	2- 7	5 1/2	- 3/8	-6.3
N	DIGITAL EQUIPMENT	46- 60	49	- 7/8	-1.7
N	ELECTRONIC ASSOC.	2- 5	2 1/4	+ 1/8	+5.8
A	ELECTRONIC ENGINEER.	7- 16	7 5/8	+ 1/8	+1.6
N	FOXBORO	28- 50	43 1/4	+ 1/2	+1.1
O	GENERAL AUTOMATION	4- 11	4 1/8	- 1/2	-10.8
O	GRI COMPUTER CORP	1- 1	5/8	0	0.0
N	HEWLETT-PACKARD CO	80-117	81 1/2	-2	-2.3
N	HONEYWELL INC	34- 56	41 5/8	-1 1/2	-3.4
N	IBM	227-288	261	-7	-2.6
O	MANAGEMENT ASSIST	4- 12	5 1/2	- 3/4	-12.0
O	MEMOREX	18- 33	18 1/8	-1 7/8	-9.3
O	MICRODATA CORP	10- 28	14 5/8	-2 7/8	-16.4
O	MODULAR COMPUTER SYS	3- 14	2 1/2	-1 1/4	-33.3
N	NCR	24- 37	32 1/2	-1 3/8	-4.0
O	PRIME COMPUTER INC	4- 14	13 1/4	- 1/4	-1.8
N	PERKIN-ELMER	19- 27	20	-1	-4.7
N	RAYTHEON CO	45- 67	59 1/8	-1 1/2	-2.4
N	SPERRY RAND	40- 52	42 1/2	-2 7/8	-6.3
O	SYCOR INC	9- 31	9	-1	-10.0
A	SYSTEMS ENG. LABS	5- 10	5	-1 5/8	-24.5
N	VARIAN ASSOCIATES	12- 17	12 3/8	- 3/8	-2.9
A	WANG LABS.	11- 20	13 3/8	-1 1/8	-7.7

LEASING COMPANIES

EXCH		1976 RANGE (1)	CLOSE NOV 10 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMDISCO INC	3- 10	9	+ 1/2	+5.8
A	COMMERCE GROUP CORP	2- 3	1 5/8	- 3/8	-18.7
A	COMPUTER INVSTRS GRP	1- 3	1 3/8	+ 1/8	+10.0
M	DATRONIC RENTAL	1- 8	3/4	+ 1/4	+50.0
A	DCL INC	1- 1	5/8	-	-9.1
N	DPF INC	5- 8	6 3/8	- 1/4	-3.7
N	ITEL	6- 15	11 7/8	-1	-7.7
N	LEASCO CORP	6- 19	17 5/8	-1 1/4	-6.6
O	LEASPAC CORP	0- 1	1/8	0	0.0
O	NPC INC	0- 1	1/8	0	0.0
A	PIONEER TEX CORP	6- 9	7 1/4	0	0.0
N	U.S. LEASING	7- 12	8 3/8	- 1/4	-2.9

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID, PRICES AS OF 3 P.M. OR LAST BID
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SOFTWARE & EDP SERVICES

EXCH		1976 RANGE (1)	CLOSE NOV 10 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 3	1 1/8	- 1/8	-10.0
O	ANACOMP INC	6- 11	7	- 1/8	-1.7
A	APPLIED DATA RES.	2- 4	3 3/4	- 1/8	-3.2
N	AUTOMATIC DATA PROC	17- 35	25 1/2	-1 5/8	-5.9
O	COLEMAN AMERICAN COS	2- 6	2 1/2	+ 1/8	+5.2
O	COMPUTER DIMENSIONS	3- 7	5 3/4	0	0.0
O	COMP ELECTION SYSTMS	5- 9	4 3/4	- 1/2	-9.5
O	COMPUTER HORIZONS	1- 2	1 1/4	0	0.0
O	COMPUTER NETWORK	2- 6	5 3/8	+1 1/4	+30.3
N	COMPUTER SCIENCES	4- 8	5 5/8	0	0.0
O	COMPUTER TASK GROUP	1- 2	1 1/4	0	0.0
O	COMPUTER USAGE	3- 6	2 1/2	- 1/4	-9.0
O	COMSHARE	2- 9	4 3/4	0	0.0
O	DATA DIMENSIONS INC	2- 4	3 1/4	+ 1/2	+18.1
O	DATATAB	1- 2	1 1/2	0	0.0
N	ELECTRONIC DATA SYS.	12- 18	15	0	0.0
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	INSYTE CORP	1- 3	1 3/8	0	0.0
O	IPS COMPUTER MARKET.	1- 2	1 3/8	0	0.0
O	KEANE ASSOCIATES	2- 4	3	0	0.0
O	KEYDATA CORP	2- 5	1 5/8	0	0.0
O	LOGICON	3- 5	4 3/4	+ 1/4	+5.5
A	MANAGEMENT DATA	1- 3	2	0	0.0
A	NATIONAL CSS INC	13- 25	17 3/4	- 5/8	-3.4
A	ON LINE SYSTEMS INC	17- 22	17	0	0.0
N	PLANNING RESEARCH	3- 5	3 1/8	- 1/8	-3.8
O	PROGRAMMING & SYS	1- 1	3/8	0	0.0
O	RAPIDATA INC	2- 5	1 7/8	0	0.0
O	REYNOLDS & REYNOLD	13- 21	16	0	0.0
O	SCIENTIFIC COMPUTERS	1- 1	7/8	0	0.0
O	TYMSHARE INC	14- 28	14 3/4	- 1/4	-1.6
A	UPS SYSTEMS	3- 5	3 3/4	- 1/4	-6.2
N	WYLY CORP	2- 7	1 5/8	- 1/8	-7.1

PERIPHERALS & SUBSYSTEMS

EXCH		1976 RANGE (1)	CLOSE NOV 10 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	8- 13	10	0	0.0
O	ADVANCED MEMORY SYS	4- 10	6 3/4	+ 1/4	+3.8
N	AMPEX CORP	5- 10	6 1/8	- 5/8	-9.2
O	ANDERSON JACOBSON	2- 4	2 7/8	- 1/8	-4.1
O	APPLIED DIG DATA SYS	13- 25	16 1/2	-2 3/4	-14.2
O	BEEHIVE MEDICAL ELEC	3- 9	8 1/4	- 1/8	-1.4
A	BOLT,BERANEK & NEW	7- 11	7 3/4	- 5/8	-7.4
N	BUNKER-RAMO	5- 10	6 3/4	- 1/2	-6.8
A	CALCOMP	4- 7	4 3/8	+ 1/4	+6.0
O	CAMBRIDGE MEMORIES	0- 6	5/8	0	0.0
N	CENTRONICS DATA COMP	20- 36	23 1/4	-2 1/4	-8.8
O	CODEX CORP	22- 42	27	0	0.0
O	COGNITRONICS	1- 1	1/2	- 1/8	-20.0
O	COMPUTER COMMUN.	1- 6	4 1/2	- 1/4	-5.2
O	COMPUTER CONSOLES	4- 7	3 1/2	0	0.0
A	COMPUTER EQUIPMENT	1- 3	1 5/8	+ 1/8	+8.3
O	COMPUTER TRANSCEIVER	1- 3	3/4	0	0.0
O	CONTEM	4- 9	7	- 5/8	-8.1
N	CONRAC CORP	20- 25	20 3/4	-1 1/2	-6.7
O	DATA ACCESS SYSTEMS	1- 5	5	+ 1/4	+5.2
O	DATA 100	6- 13	6 1/4	-1 5/8	-20.6
A	DATA PRODUCTS CORP	5- 15	10 1/2	- 1/2	-4.5
O	DATA TECHNOLOGY	1- 2	1 1/4	- 1/8	-9.0
O	DATUM INC	1- 2	3/4	+ 1/4	+50.0
O	DECISION DATA COMPUT	1- 4	1 1/2	- 1/8	-7.6
O	DELTA DATA SYSTEMS	1- 1	5/8	0	0.0
N	ELECTRONIC M & M	1- 4	2 5/8	- 1/4	-8.6
O	FABRI-TEK	1- 1	7/8	0	0.0
O	GENERAL COMPUTER SYS	0- 2	3/8	0	0.0
N	HAZELTINE CORP	4- 12	8	- 3/8	-4.4
N	HARRIS CORP	34- 55	50	- 1/4	-0.4
A	INFOTERM CORP	9- 20	10 1/2	-1	-8.6
O	INFOREX INC	3- 7	3 7/8	- 3/8	-8.8
O	INFORMATION INTL INC	10- 18	11 1/2	- 1/2	-4.1
O	INTEL CORP	47-109	47	-3	-6.0
A	LUNDY ELECTRONICS	3- 7	3 3/8	- 1/8	-3.5
O	MSI DATA CORP	3- 7	6 1/2	- 1/8	-1.8
A	MILGO ELECTRONICS	15- 21	20 1/2	+2 1/4	+12.3
N	MOHAWK DATA SCI	3- 10	5 3/8	- 3/8	-6.5
O	PENRIL CORP	1- 3	1 7/8	0	0.0
A	PERTEC CORP	3- 8	5 7/8	- 1/4	-4.0
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	3- 10	2	0	0.0
O	QUANTOR CORP	4- 6	4	+ 1/4	+6.6
O	RECOGNITION EQUIP	6- 11	7 3/4	- 1/4	-3.1
N	SANDERS ASSOCIATES	6- 11	7 3/8	- 1/2	-6.3
O	SCAN DATA	1- 4	1 1/4	- 1/8	-9.0
O	STORAGE TECHNOLOGY	9- 13	10	+ 1/8	+1.2
O	T BAR INC	5- 10	5 5/8	0	0.0
O	TALLY CORP.	4- 6	4	+ 1/8	+3.2
O	TEC INC	3- 7	6 1/2	0	0.0
N	TEKTRONIX INC	45- 69	58 3/4	- 3/4	-1.2
N	TELEX	2- 5	2 1/4	- 3/8	-14.7
O	WANGCO INC	11- 27	21 1/8	0	0.0
O	WILTEK INC	2- 2	1 3/8	0	0.0

SUPPLIES & ACCESSORIES

EXCH		1976 RANGE (1)	CLOSE NOV 10 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED SYSTEMS INC	1- 4	3 3/8	0	0.0
O	BALTIMORE BUS FORMS	3- 5	3 1/2	- 1/8	-3.4
A	BARRY WRIGHT	6- 10	8	- 5/8	-7.2
O	CYBERMATICS INC	0- 1	1/2	0	0.0
A	DATA DOCUMENTS	25- 45	45 1/4	0	0.0
O	DUPLEX PRODUCTS INC	13- 24	12 3/4	- 1/4	-1.9
N	ENNIS BUS. FORMS	6- 5	5 3/4	+ 1/4	+4.5
O	GRAHAM MAGNETICS	8- 13	10 1/4	+1	+10.8
O	GRAPHIC CONTROLS	13- 19	16	0	0.0
N	3M COMPANY	53- 66	55 1/4	-4 1/8	-6.9
O	MOORE CORP LTD	32- 51	33 1/4	-1 1/2	-4.3
N	NASHUA CORP	11- 18	15 1/4	-1 1/4	-7.5
O	STANDARD REGISTER	15- 19	17 1/4	0	0.0
O	TAB PRODUCTS CO.	5- 11	8 3/4	0	0.0
N	UARCO	19- 25	19 5/8	+ 1/8	+0.6
A	WABASH MAGNETICS	4- 9	8 3/8	- 3/8	-4.2
N	WALLACE BUS FORMS	19- 25	22 1/2	+ 3/4	+3.4

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NEWSPAPER

IBM On Trial

U.S.: Gathering Steam

By Catherine Arnst
Of the CW Staff

NEW YORK – IBM attempted to turn plug-compatible manufacturers (PCM) into "dying companies," Justice Department attorneys charged recently as the government began the peripherals portion of its antitrust case against the corporation.

The government will attempt to prove that separate and distinct markets exist for the different peripheral products, that PCMs were able to enter those markets successfully with products equal to or better than IBM's at prices 10% to 15% lower and that IBM used its dominance in the computer market to destroy that competition.

In what it considers one of the more powerful segments of its case against IBM, the government will present approximately 550 documents and 13 witnesses to the court in the next few months.

Those witnesses will include Laurence Spitters, founder and former chairman of the board of Memorex Corp., three others from Memorex, three witnesses from Storage Technology Corp., two from California

(Continued on Page 2)

Calcomp: 'Show and Tell'

By Molly Upton
Of the CW Staff

LOS ANGELES – The California Computer Products, Inc. (Calcomp) antitrust trial against IBM will be a "show and tell" trial illustrated by charts, judging by the opening statements of both sides.

Charts are but one illustration of how trial by jury will influence the conduct of the case.

Judge Ray McNichols denied IBM's motion for a mistrial the morning after Calcomp attorney Max Blecher's opening statement.

David Boies, attorney for IBM, had asked for a mistrial on the grounds that Blecher's statement (see story on Page 3) "went very substantially beyond what is appropriate in any case, particularly before a jury."

Blecher's remark contained "constant repetition of argumentative words," whose only purpose was to "prejudice, confuse and inflame the jury," Boies said.

Blecher also used IBM documents in a misleading manner, taking at least one out of context, he said. That document, according to Blecher's

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An Offering Not for the Novice

IBM Moves Into Mini Arena With Series/1

By Esther Surden
Of the CW Staff

NEW YORK – IBM made its long-expected move into the minicomputer arena with the introduction of the Series/1 here last week.

The Series/1 is a minicomputer in every sense – from its 16-bit word and its limited operating system software to its purchase-only status.

It is also in the price range of standard minicomputers.

A Series/1 Model 3B with 32K bytes of storage, diskette and disk combination unit, printer and attachment for a teletypewriter costs $22,312, according to an IBM spokesman. The CPU with 16K bytes of memory costs $5,190, he added.

The Series/1 was designed for volume use by sophisticated organizations with programming and systems design know-how, but quantity discounts will not be available, IBM said.

The modular, component-oriented mini, which can be configured in any number of ways, is in the performance range of the Digital Equipment Corp. PDP-11/34, Hewlett-Packard (HP) 21MX and Data General Corp. (DG) Nova, the spokesman claimed.

DEC and DG would not comment on the cost of their comparable minicomputers. HP, however, said the Series/1 could be compared to its 660 nsec 2112A with 14 I/O slots and 16K bytes of memory which costs $7,900 including extensive software and is discountable.

Two Series/1 processor models with two submodels each were introduced. The Model 3A on one board fits into half the width of the available 19-in. rack space and contains a card cage with four I/O card slots. Each I/O card can address one to 16 devices, the firm said.

The Model 3B differs from the 3A only in that it has 13 I/O slots.

Both units feature a 64K-byte maximum storage capacity with an 800 nsec cycle time for the memory. Average instruction time is 11.8 µsec, IBM said.

The Model 5A can accommodate up to 64K bytes of memory and has eight I/O slots. The B model can accommodate up to 128K bytes of memory and has three I/O slots.

Memory cycle time for the Model 5 is 660 nsec; average instruction time is 3.9 µsec. Both units include a storage protect feature and are contained on three boards, IBM noted.

The Model 3 has a 168-instruction set while the Model 5 has 177 instructions. Each can address up to 256 devices and features four priority interrupt levels with

(Continued on Page 4)

CPE Finds Three 65s Can't Equal a 168

By Don Leavitt
Of the CW Staff

ATLANTA – Although the CPU capacity of an IBM 370/168 is roughly three times that of a 360/65, the 168 can absorb "considerably more" work than would saturate three 65s, according to a computer performance evaluation (CPE) technician with American Airlines.

American's in-house evaluation and benchmark team reported these results as part of its evaluation of a 4M-byte 370/168 and a 4M-byte Amdahl 470V/6, according to Bill Miller, who explained the airline has already made the decision to buy one or the other.

Presenting a paper at the annual national meeting of the Computer Measurement Group (CMG) here last week, Miller said the performance of a Model 65 "is generally agreed to degrade" when the total CPU occupancy goes above 60% to 70%.

However, he added, "a 370/168 can be driven at essentially 100% for sustained periods of time" and further economies are available from consolidating peripheral devices and other resources required to satisfy peak demands on several machines.

The CPE staff at American reached these conclusions in its still continuing search for another large-scale processor for its commercial DP operations, Miller said.

The current equipment consists of a 370/168-1 surrounded by 40 6,250 bit/in. tape drives, 64 Memorex 3330-type disk drives and 16 IBM 3350 fixed-head disk units.

Evaluation Tools

The airline is using a number of tools to aid its evaluation, he told the group. The three basic types of tools include SMF analysis packages, software monitors and hardware monitors.

In most large-scale IBM shops – including American Airlines – SMF data is collected "as a matter of course" and "failing to glean as much information as possible from [this] data [would be] a serious mistake," he said.

Miller's group uses the Sara package, developed by Boeing Computer Services, to analyze SMF output, running it daily as the source of most routine management reporting, he explained.

Software monitors yield more detailed information about system internals than SMF but, used poorly, they can create overhead, tie up an initiator and cause system crashes, he warned.

Nonetheless, American uses the Configuration Utilization Evaluator (CUE) package from Boole & Babbage, Inc.

Hardware monitors attach to the wiring of a computer system and cannot produce the problems some software monitors do. However, the large sophisticated type of monitor American needed is a very expensive piece of gear, he said.

Miller's group recently acquired a Tesdata MS88-III for use in providing continuous system profiles for all major applications as well as doing detailed measurements for the IBM-Amdahl benchmark, the technician said.

Ryan, Hammer Theories Collide On DP's 'Pathway to the Future'

By Edith Holmes
Of the CW Staff

ALEXANDRIA, Va. – Computers should be used for the economic replacement of routine tasks, but not in areas where human judgment is involved, Dr. Frank B. Ryan, director of information systems for the U.S. House of Representatives, told the Association of Computer Programmers and Analysts (Acpa) conference here recently.

The more memory the computer industry can pack on a chip, the closer human society will come to artificial intelligence and from there to voice-to-voice communication with computer systems, Dr. Carl Hammer, director of computer sciences for Sperry Univac in Washington, D.C., said to the same meeting of programmers and analysts a day later.

Two different men. Two opposing ideas. A pivotal point on which the conference, entitled "Pathways to the Future," turned.

At the beginning of his career, Ryan was a football player, a quarterback for the Cleveland Browns and then for the Washington Redskins.

While playing for the Browns, Ryan wrote a computer program called "Probe" to organize and analyze football data, aiding trend analysis. Ryan said he devised the program to take the drudgery out of the night-before-the-game strategy sessions.

Probe provided a study of the opposing team and a strategy for the Browns to

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As Calcomp vs. IBM Opens

Defense Stresses Competitive Market

By Molly Upton
Of the CW Staff

LOS ANGELES – The DP industry demonstrates all the elements of a competitive environment where participants are constantly needing to upgrade their products and reduce prices in order to obtain and retain business.

David Boies, a lawyer for IBM, thus set the tone for IBM's defense in the antitrust case filed against it by California Computer Products, Inc. (Calcomp).

Focusing on the issue of monopoly for the entire morning and into the afternoon, Boies told the jury that in order for Calcomp to recover damages, it would have to establish all five of the following points:

- What the market is.
- IBM possesses monopoly power in that market.
- IBM has achieved its position in the industry in some kind of wrongful way.
- IBM's actions were wrong and damaged Calcomp.
- The extent to which Calcomp was damaged.

Jack Brown, another lawyer for IBM, amplified the last two points in IBM's defense and indicated Calcomp's declining revenues resulted from being outpaced by advances in disk drive technology and Calcomp's own management problems, not action by IBM.

In deciding whether IBM is a monopoly, Boies said the jury would have to ask itself whether "IBM is a company able to sit back and ignore competitors, leading a quiet life, or whether it is constantly forced to improve its product and reduce prices."

If customers have no alternative to an overpriced product, then there is a monopoly, he said.

Calcomp has done well in the computer business, he said, having been able to offer products at lower costs than IBM's because it copied them and, therefore, didn't incur extensive research and development costs.

To illustrate IBM was no larger than its competitors, Boies showed a 1952 ranking of the revenues of large U.S. industrial firms. IBM was seventh behind such future competitors in the DP field as General Electric, RCA and Sperry Rand.

Calcomp, he said, has conceded 31 companies compete in the general systems marketplace. But there are many more including Hewlett-Packard, Interdata, Four-Phase Systems and Itel, he said.

Boies then showed several charts illustrating the rise of firms' DP revenues during the period in which Blecher had said IBM sounded "the death knell."

Although all of the companiea illustrated showed revenue growth, Boles did not once mention earnings or losses of these firms.

This growth in both the number and size of firms in the industry and their ability to compete illustrates the lack of monopoly power, he said.

Boies said he will counter Calcomp's charge that IBM kept revenues constant by raising CPU prices while lowering disk prices, for example. His retort to this argument is that computing costs have declined despite a rise in the consumer price index.

This price decline is the "best illustration of the fruits of competition in the industry benefiting the consumer," he said. IBM has been a leader in improving price/performance offerings.

"In effect, Calcomp is arguing that IBM should be required to keep its prices high so it [Calcomp] could make more money," Boles said.

Boies said IBM has three basic beliefs which contribute to its success:

- It must maintain respect for the individual.
- IBM should provide the best customer service.
- The organization should strive to do every task in a superior fashion.

The Calcomp claims, Brown charged, are based on two erroneous assumptions – that there would be continued demand for old disk products and that even if these products were obsolete, as they were by 3330 technology, Calcomp could continue to get a fair price for them.

U.S. vs. IBM Gathering Steam

(Continued from Page 1)

Computer Products, Inc., three representing add-on memory manufacturers and two from the Bank of America.

"Prior to IBM's actions to eliminate and restrict actual and potential competition in the plug-compatible peripherals market, the PCMs were successful in the small segment of the market they captured.

The peripherals market was important to IBM because it accounted for 53% of total systems business in 1970; by that year, PCMs had made considerable inroads into IBM's dominance of that market, the government said.

A number of companies had entered the peripherals market after IBM announced its 360 line in 1966 because, for the first time, IBM's differently sized commercial systems were capable of using identical peripheral equipment; the plug-compatible market was made even more attractive by IBM's high price levels and profit margins on these products.

IBM designated peripherals as a "key corporate strategic issue" in 1970 after the government issued a directive in the Peripheral Equipment Procurement Bulletin No. 70-9 requiring federal agencies to "review all installed leased peripheral components for which there are compatible, reliable and comparable substitutes available at lesser cost.

At a management committee meeting after this bulletin was issued, IBM internal documents show, the corporation decided to assess all factors affecting the impact of competitive products on IBM's business and then produce a strategy of technical escalation.

One of the strategies a task force recommended and IBM adopted, code-named "Mallard," was aimed at the disk drive market.

The government claimed this disk drive was only a revised version of the 2314 because IBM had replaced one spindle with a portion of the control function normally found in the 2314 controller.

The remainder of the control function was transferred to the CPU and called an Integrated File Adapter, Justice contended.

In the tape drive market, IBM attempted to undermine competitors with a new series of tape drives, the 3420, code-named "Aspen," the government claimed. The 3420 was a "warmed-over" version of the "overpriced" 2420, whose sales were dropping, it said.

Aspen had the same physical and performance specifications as the 2420 but a different interface design and price tag.

In order to prevent further competition, IBM approved long-term lease plans in early 1971 that would offer substantial price reductions to users while locking them into a total IBM system. Through the Fixed Term Plan (FTP), offered for tape drives, disk drives and printers, IBM offered an 8% discount on a one-year lease and a 16% discount on a two-year lease.

In order to recoup its losses from the leasing plans, IBM announced price increases in July 1971 on CPUs, memories and other portions of the systems not covered by FTP. In August 1971, IBM executives predicted "the net effect of [FTP] and CPU price changes will be a wash insofar as business volumes are concerned," internal documents said.

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Plaintiff Claims Documents Will Prove IBM's Guilt

By Molly Upton
Of the CW Staff

LOS ANGELES – California Computer Products, Inc.'s (Calcomp) $102 million antitrust suit against IBM will be conducted largely through examination of internal IBM documents, Calcomp attorney Max Blecher told the jury in his day-long opening statement here last week.

The jury can "determine IBM's guilt by its own documents [which constitute] a diary of all acts and purposes" with which Calcomp is charging it, he said.

IBM, between 1963 and 1972, undertook conduct to "eliminate, suppress and destroy competition for the purpose of maintaining its monopoly," Blecher said. The 1972 date was selected because that was the year in which IBM last attempted "to do in" Calcomp, he explained.

This "nailed the lid in the coffin of a company which until then had been a vigorous, profitable company," he said.

Calcomp is charging IBM attempted and/or succeeded in its monopolization plans for the industries of general-purpose systems, disk drives and disk drives attachable to IBM 360s and 370s.

Blecher used the analogy of a gun turret that could turn and lash out at different areas IBM saw as threatening.

Why the three areas? Partially to show IBM had the capacity to trade off profits from one area to another when it decided to focus its turret, he said.

For example, Blecher said he will illustrate through IBM documents that IBM decided to take low profit margins on certain CPUs it would market for prestige reasons while recouping much of this low profit margin through high peripheral charges.

When the number of IBM mainframe competitors had been reduced, IBM then focused on the plug-compatible manufacturers such as Calcomp, he said.

Again through IBM documents, Blecher said he intends to prove to the jury that IBM used this procedure in reverse, cutting prices by repackaging its 2314 drives as 2319M.

IBM then initiated its Fixed Term Plan (FTP) which offered users at least a 16% savings over two years – but a month later, it raised CPU prices to make the FTP costs to IBM a wash item, Blecher said.

After focusing on IBM's and others' views of the corporation's market share in the general-purpose systems industry, the Calcomp case will look at IBM's actions in the systems area, Blecher said.

The attorney showed the jury various IBM documents indicating IBM had over 70% of the general-purpose market between 1964 and 1969.

In the scientific area, Blecher's thesis that IBM did not maintain its monopoly solely through superior products is supported by documents that show IBM machines were "outpriced and outperformed," according to Blecher.

The Calcomp case will then focus on IBM's attitude toward and reaction to the leasing industry, which it came to regard as a competitor, not a customer.

Leasing Industry Strategy

IBM deliberately calculated its multipliers, or the number of months' rent, that equal the purchase price, in order to "knock lessors out," Blecher stated.

The company also deliberately brought out the 370/155 and 165 "with the knowledge these would be withdrawn in 18 months, leaving lessors with an inventory of obsolete machines," he charged.

Lastly, the prosecution will focus on actions in the plug-compatible industry, an issue with which Calcomp is personally concerned and for which it claims damages.

Calcomp vs. IBM: 'Show and Tell' Trial

(Continued from Page 1)

presentation, showed IBM management contemplating leaking to the investment community news of its planned 370s two years before their introduction.

The purpose of such action, Blecher alleged, would be to help dry up financing available to lessors.

Because the jury had witnessed Blecher's version of this document, it was "just not susceptible to later coming back and correcting" its mistaken impressions, Boies argued.

At the end of the day when the jury was dismissed, McNichols talked to counsel and spectators.

For the record, he said he recognized that opening statements in this case "have gone far beyond the normal scope of opening statements."

But doing so has done far more to further the jury's understanding of the case than proceeding with the old "sterile" type of opening statements, he added.

After IBM attorney Jack Brown described what some would consider unethical although not illegal activities by Calcomp, McNichols remarked the "pot and the kettle are equally discolored."

In attempts to indicate to the jury how incriminating internal documents from the other side are, both Calcomp and IBM have enlarged reproductions of these papers, in addition to fancy graphs.

The IBM counsel table was festooned with a large pink and yellow inflated duck as well as several toys and other gadgets which represented a money-losing venture by Calcomp.

During his discussion of Calcomp's attempts to obtain and copy IBM's disk designs, Brown placed before the jury two spindles from a 3350 drive. He also gave them a head and arm from the drive and showed an enlarged version of that mechanism.

Spectators who had lined up at 8:30 a.m. to procure a seat on uncomfortable wooden benches appreciated the repartee between the judge and lawyers on the subject of the toys.

Attorneys for both sides seem acutely aware the case could proceed to appeals court. In replying after Boies' objection about his use of documents, Blechers stated IBM intends to fight the admission of evidence document by document since it expects to be the appellee in the appeals court.

Blecher compared the IBM tactics to Iwo Jima. "We'll win, but it will be one piece of real estate at a time.

"This is the same kind of assault IBM has waged on Edelstein," he said, referring to the judge in the New York trial.

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IBM Enters Mini Arena With Series/1

(Continued from Page 1)

eight general-purpose registers per level.

Bit, byte, word and double-word addressing can be accommodated, the spokesman noted. Power failure detect and automatic restart are standard features.

The I/O channel can operate under direct program control or can cycle-steal. Data is transferred on either a byte or word basis and parity checking is available on a byte basis.

Data is transferred over the channel at 1.2M byte/sec maximum for the Model 3 and 1.6M byte/sec maximum for the Model 5, IBM said.

The Series/1 comes with no standard higher level programming language. Operating system software provided at no charge consists of Stand-Alone Utilities (formerly known as the System Control Program).

The Stand-Alone Utilities include modules to prepare and service disk and diskette devices, IBM said.

Software not included but available is Control Program Support, a set of object modules which provide task management and DP I/O support. IPL loaders for both the disk and diskette are provided. This product costs $15.50/mo on a 24-month, paid-up license basis, IBM said.

Also available is a Base Program Preparation Facility (BPPF) for applications program development. It includes a text editor, macro assembler and linkage editor and costs $90/mo on a 24-month, paid-up lease.

With the BPPF, "theoretically any higher level language can be programmed, provided the user generates his own compiler," the spokesman noted.

If a Series/1 CPU is sold by a user after the 24-month period, the new user will have to pay to relicense the software, he indicated.

An optional I/O expansion unit for the Series/1, including a power supply, provides space for up to 14 additional feature attachment cards.

Communications can be handled on the Series/1 via asynchronous, binary synchronous, or Synchronous Data Link Control (SDLC) single-line control at 9,600 bit/sec maximum; high-speed binary synchronous single-line control at 56 kbit/sec maximum; or asynchronous and binary synchronous four- or eight-line control at 9,600 bit/sec maximum, IBM said.

The Series/1 CPUs can communicate with IBM 360/370s, IBM 3s or each other under SDLC, the spokesman noted.

The floating-point processor option for the system allows both single- and double-precision arithmetic using 30 additional instructions and four 64-bit registers, IBM said.

Another optional feature is the Model 4964 diskette unit featuring IBM's double-sided floppy disk. The microprocessor-controlled unit, which is capable of reading and writing on both sides of a diskette, can contain 492K- to 606K bytes of storage depending on the sector size chosen.

Data formats of 128-, 256- and 512 bytes per sector can be accommodated. The average data rate is 31.2 kbyte/sec, the firm said.

A Model 4962 9.3M-byte disk storage module with two movable data heads and 303 track/head is another optional feature for the Series/1. Average access time is 40 msec with an average access time of 10.1 msec.

A fixed-head option adds another 120K bytes of storage capacity, the spokesman said. A combined diskette and disk unit is also available.

A sensor I/O unit, also optional, can be mounted in half of the standard rack. It includes power supply, terminator card and slots for eight sensor I/O feature cards. The cards are of standard size, IBM emphasized, to facilitate the attachment of standard sensor I/O devices.

Additional optional features include the Model 4974 serial printer, a 120 char./sec bidirectional tabletop matrix printer with a 64-character set, a CRT with a 24-line by 80-character display and a 66-key keyboard with a battery backup unit.

Catamore Case Takes Unusual Appeals Turn

BOSTON – In an unusual move, the First Circuit Court of Appeals here last week ordered IBM to provide additional data on its case with Catamore Enterprises, Inc. before issuing a ruling on the jewelry manufacturer's petition for a rehearing of the case.

Sources described the move as "unusual," adding that if the court is about to reverse itself, this would probably be a logical step in that process. No one around the court could remember such a request being made before.

Earlier, the appeals court had overturned a lower court decision awarding Catamore $11.4 million in damages, holding that Catamore had waited too long to file its case against IBM and the jury in the original trial had not specifically found IBM guilty of fraud.

Catamore is now seeking to have the appeals court rehear that decision. If the appeals court does not rehear the case, it has ordered a new trial for the case at the district court level.

In a statement, Thomas K. Christo, attorney for Catamore, said, "We're very encouraged by the court's action and are looking forward to a new appellate opinion.

Correction

The Burroughs Corp. B1800 series provides 40%, not 40 times, more throughput than its B1700 predecessor [CW, Nov. 15].

AT&T Antitrust Trial Gets Rolling Again

WASHINGTON, D.C. – After debating the question for nearly two years, a federal judge here has decided he and his court do have the authority and responsibility to hear the U.S. government's antitrust suit against AT&T.

Judge Joseph C. Waddy ruled from the bench last week that the U.S. District Court for the District of Columbia, not the Federal Communications Commission (FCC), has jurisdiction over U.S. vs. AT&T.

First raised by AT&T in February 1975, the question of whether the federal court or the FCC should hear the government's complaint against the telephone company caused Waddy to stop all document exchanges and interviews with prospective witnesses by the parties.

The judge's decision on Nov. 16 means the Justice Department and AT&T can move on with their discovery procedure.

Ryan, Hammer Theories Collide

(Continued from Page 1)

follow, he explained.

Shortly after writing Probe, Ryan was "dismissed" from the Browns and went to play for the Redskins. In Washington he encountered Vince Lombardi, who was excited about Probe's possibilities.

The system was developed and successfully marketed, Ryan recalled. It ran on a central computer based in Cleveland and was used jointly by the Giants and the Redskins – except when they played each other, he said.

In 1971, these two teams won five games and lost 23. Both coaches were fired and "Oro-Probe," as the program was then called, was canned, Ryan said.

Two things were wrong with Probe, its author stated. Before the program, the coaches enjoyed the freedom of using their own intuition. The computer system forced them into a rigorous method to which they weren't accustomed.

Probe took human judgment out of planning strategy. Ryan concluded he really couldn't put this human activity into a machine.

The eight computer systems in the legislative branch of the Federal government either substitute for or complement a routine procedure, Ryan said. None of these systems have applications that replace human judgment.

Carl Hammer, who has been involved in electronic computing since it began, presented a somewhat different view.

"It took man thousands of years to shake off physical labor," Hammer said. "Now we must learn to let machines do our mental drudgery for us; we must become a knowledge society."

The 1M chip is coming, he predicted, and with it a kind of "artificial intelligence" including computer voice input.

"Today, we communicate with the computer through our fingers," he said, pointing out the inefficiencies – not to mention the errors – involved in this process.

"With 1M chips, we'll be able to go to computer voice input," Hammer said, adding "selective speech recognition is going on now, but it won't be practical until we have a 100K chip or better.

Computer voice input will be followed by true voice recognition represented by going from voice into print. Chips with 10M capacities will permit language translation – from print to print. Chips with 100M capacities will allow voice-to-voice language translation, thus putting all the United Nations translators out of business, Hammer said.

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Urged to Manage Technology's Destiny

Software People: Keepers of Man-Machine Interface

By Edith Holmes
Of the CW Staff

ALEXANDRIA, Va. – "It is up to you, the programmers and analysts, to serve as the interpreters between the human being and the machine," Rep. Charles Rose told the annual conference of the Association of Computer Programmers and Analysts (Acpa) here recently.

"The software challenges are not with technique but with content, and the real pressures that face the whole industry in the future will center not on mechanical and technological fantasies but on designing software to meet the needs of the users," the North Carolina Democrat said in his keynote address to Acpa's sixth annual meeting.

Comparing the technology of the computer and communications industry to a train moving forward at increasingly uncomprehensible speeds, Rose urged his listeners to manage destiny, "to take charge of the train."

Rose, who chairs the Ad Hoc Computer Subcommittee of the Committee on House Administration in the U.S. House of Representatives, drew his analogy from a story about Supreme Court Justice Oliver Wendell Holmes who, at age 88, found himself on a train and unable to find his ticket.

Recognizing the jurist as he searched unsuccessfully through his coat pockets, the conductor told Holmes not to worry. He would probably find the ticket later, and the Pennsylvania Railroad could certainly trust him to mail it in, the conductor said.

The congressman said Holmes then looked up at the conductor with some irritation and said, "My dear man, that is not the problem at all. The problem is *not* where my ticket is. The problem is, where am I going?"

Technology Train

"We are on a technological path, a train if you like; we have been given the right to passage; and we are speeding forward. Suddenly, when it comes time to turn in our technological ticket to get off the technological train, we don't know where it is," Rose said.

"And what is worse, we have become so programmed to follow directions and punch time clocks that we have forgotten where we are going."

How fast is the train going? Advances in computer-assisted instruction and medical diagnosis by computer and the possibilities presented by voice-sensitive typewriters and complete home telecommunications systems give some idea of the speed with which technology is moving forward, the congressman suggested.

Software people – not hardware people – should have charge of the human interface, in Rose's view.

"The inventors of hardware and the entrepreneurs who sell it have unbounded enthusiasm for the future, for they clearly see that anything is technically possible and they are rushing forward to invent it," he said.

"Unlike Justice Holmes and many of us, they have their keypunched tickets firmly in hand; some of them have even laid the railroad track and built the train; and they know *exactly* where they are going.

"Hardware people love hardware. But sometimes software folks wonder if they love people," Rose continued.

Software is the key to using technology creatively, the congressman said.

"Justice Holmes had a ticket with the name of the city printed on it. He had a program, a direction. Without it, the train was useless to him. It was, in fact, an obstruction. He was lost without the software," Rose said.

In part because the development of software packages involves people rather than machines, the attendant policy issues that must be considered by the courts and in Congress are complex, Rose stated. Two areas being addressed in both these places now are copyrights and privacy, he added.

Rose questioned in particular whether industry should have the right to take public-paid-for information and process it into private software packages, copyright it and sell it back to the government.

"On the other hand, when a professional programmer initiates a package of information which is innovative and useful, combining various aspects of software technology such as indexing and abstracting, it does seem fair to reward that individual with a copyright," he noted.

While the congressman said he did not know how the questions of copyrights for software or of software patentability will be resolved, he expects the new copyright laws being written in Congress and future court rulings on software patents to deal with these problems – and quite possibly in the industry's favor.

CW
At Acpa

Rose noted everyone in the audience knew of the abounding dangers concerning privacy. Attempts to protect privacy are fallible, he said.

But "if we are ethical about the kinds of information we put into data bases, and if we are careful to include only the essentials about individual lives, we may find we do not need to worry so much about protection," he said.

Finally, Rose urged his listeners to follow all congressional attempts to set policy in connection with the industry. "We make mistakes and misjudgments. We are ordinary citizens like the rest of you and these new inventions are taking us into a world we do not understand either. We are doing the best we can with what we know and what others tell us," he reminded them.

The congressman suggested the programmers and analysts begin their coverage of activities on Capitol Hill by following hearings on the various "Bell Bills" being held by the House Subcommittee on Communications, chaired by Lionel Van Deerlin of California.

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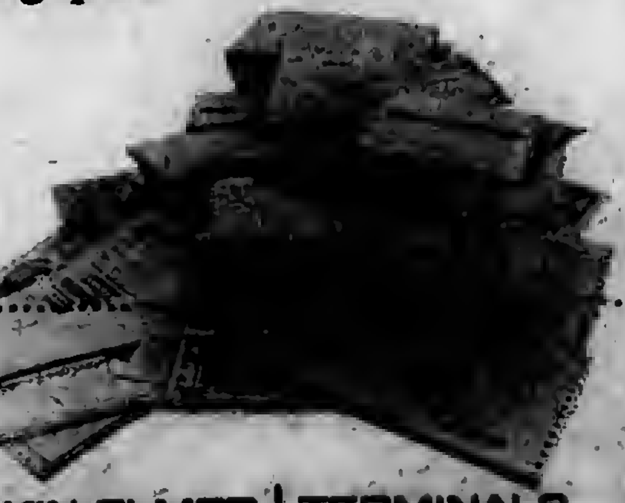

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Cost-Control System Suggested To Involve Entire Firm in DP

By Don Leavitt
Of the CW Staff

ATLANTA – Because the effective use of DP resources hinges on the involvement of all affected groups within a corporation, a coherent system of cost control may be the mechanism to provide that involvement, according to a consultant for Arthur Young and Co.

Corporate, operating division and computer center management each have opinions of what constitutes DP "performance" and each can be motivated to contribute to that performance, William Sherer told a Computer Measurement Group (CMG) session here last week.

Cost information per activity is a "common denominator" understandable to all parties impacted by DP; a system that encompasses expenses, system activities and planned personnel and machine changes might well bridge the communications gap that often exists between these groups, he added.

To be effective, however, the cost-control system must be designed around the needs of the groups involved, he warned.

CW At CMG

Senior management is responsible for deciding what functions have DP potential and for keeping the computer center activities in balance with efforts of the rest of the organization, Sherer reminded the group.

But it is departmental or division managers who have responsibility for the final output of the information from the computer center, he said, adding responsibility in this instance is defined not in the technical sense of efficient operations per se but in the general sense of cost per job performance.

The operational manager is in the best position to judge the computer-generated output and its value to his own area, but there are subjective factors that influence the thinking of many of the managers at this level, Sherer said.

The manager has to be concerned about the service level – the turnaround or response time – he can get from the data center. But the tuning done by the DP technicians is invisible to him.

In much the same way, concern for reliability of results is natural, but this is out of the control of the operational manager, he added.

The computer center management is much closer to the specific work than the other groups. A cost-control system would reveal the real costs of current projects, applications development work and even some possible configuration changes, Sherer noted.

There are four components in an activity-costing system, he went on. The definition of each responsibility center is one of those components and there are no hard and fast rules for deciding which portions of DP activity need to be set up as such centers.

But, he said, there are three broad categories of work that can be subdivided into unique responsibility centers. "Routine" labor works with data entry, processing and output functions, while "nonroutine" labor encompasses the professional DP staff. The third category covers the work done by the equipment itself, Sherer explained.

Once the centers are identified, the next step in the development of a cost-control system is the association of costs with the activities within the centers, he said. Costs are either direct or indirect, he noted, and assignments can become confused when a particular user has dedicated resources.

Measuring activities' performance provides an indication of how much work was done by each responsibility center. Many of the activities are easily definable and measurable, but others – particularly those done by the nonroutine labor force – are less clear, he acknowledged.

But, one way or another, they can finally be isolated and computed, he said.

The final piece of the puzzle leading to a coherent cost-control system is setting rates for the various activities. Sherer reminded the CMG session that systems might be built around either actual or standard rates; actual rates might seem more reasonable, he admitted, but standard rates normally lead to more consistent billings.

That tends to make that approach more acceptable to the end user, he added.

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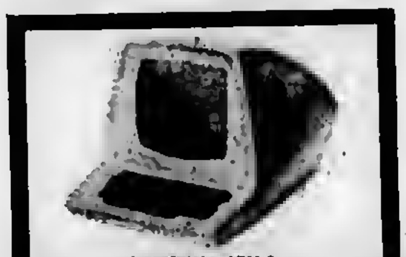
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Illinois Inviting Citizens to 'Beat Bum Rap Sheets'

By Catherine Arnst

Of the CW Staff

CHICAGO – If you live in Illinois and think you've gotten a bum rap, the state's Law Enforcement Commission is willing to help you beat it.

Illinois has circulated posters and brochures telling persons with arrest records how to go about inspecting and if necessary correcting both the computerized and paper criminal history files kept on them.

Since the program was started March 15, approximately 80 files have been requested and 75 were found to have errors, according to Art Loos, systems superintendent of the Illinois Bureau of Identification.

To check an arrest record, a person must identify himself at any police station or sheriff's office and fill out a "Request for Access and Review." A fee of not more than $10 can be charged for processing the request.

Challenges on Errors

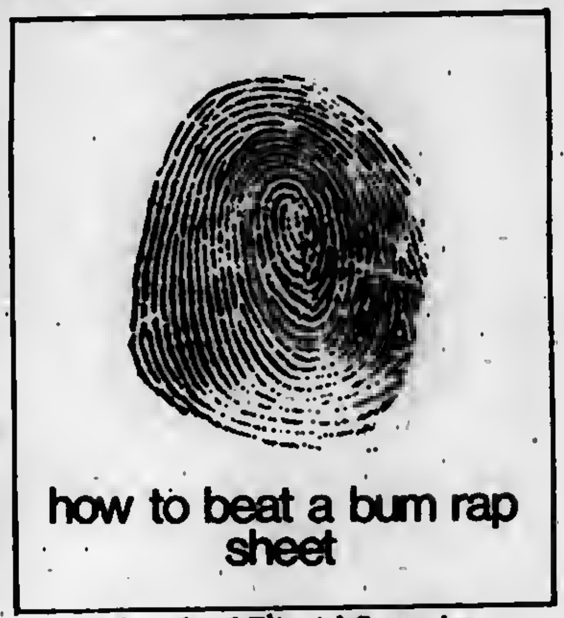
Within six weeks, written notice of an appointment for inspection of records is sent, and the person returns to inspect the record. If any errors are found, the individual can file a "Record Challenge."

If the application is denied, an administrative review can be requested. If still not satisfied after this procedure, an individual can file an administrative appeal with the Illinois Criminal Justice Information Systems Council. The council's decision is final unless a civil suit is filed.

Statewide Terminals

The Bureau of Identification maintains 1.8 million records on 100,000 people in its criminal justice information system. Records are corrected and updated through any one of 32 Incoterm terminals located in police stations throughout the state, Loos said.

At the end of October, the state began systematically purging from its files all records on people 70 years or older who have not had an arrest in 10 years; this procedure will take about three weeks, he said.


how to beat a bum rap sheet

A Sample of Illinois' Campaign

Beleagured Bill for Mass. Justice System Signed

By Nancy French

Of the CW Staff

BOSTON – A bill authorizing $250,000 for the next phase of this state's computerized criminal justice information system was signed by Gov. Michael S. Dukakis here recently after a year-long struggle that threatened to delay the project indefinitely.

The bill was originally proposed as an appropriation to match federal Law Enforcement Assistance Administration (LEAA) funds on a 90%-10% basis.

The measure was defeated by this state's cost-conscious legislature, but after Dukakis and Attorney General Frank Bellotti got behind it and the system was thoroughly explained to the legislators, it was passed, according to Frank Keefe, systems engineering director for the Massachusetts Committee on Criminal Justice.

Specific Costs Cited

The bill approved by the legislature provides a very specific appropriation to be paid out of the capital outlay budget – a measure legislators were able to come to grips with, Keefe said. It allocates state funds for 50% of the cost of new work at the computer site and 10% for renovation, he explained, and contains actual bid information provided by contractors.

Despite the setback that threatened to kill the project, conversion of criminal records never was discontinued, Keefe said, although he was unable to estimate what percentage of the records have been converted to date.

'Effective Half the Time

He did say, however, that when the criminal records data base goes up it will be able to respond to about 50% of the inquiries police will make. Within two or three years, that percentage will edge up to 80% or 90%, he added.

"It's been a hair-pulling, teeth-pulling type of effort" – not because people objected to the concept, but rather because of a problem with constitutional separation of powers between the state's three branches of government, he explained.

The problem goes back to a ruling by the state's Supreme Judicial Court which stated that any management data furnished by the courts could not go to an executive agency to be manipulated, he said.

While about 48 of the 50 states maintain criminal justice information within the executive branch, Massachusetts criminal records reside in the judicial branch.

After a statement of understanding was drawn up between the executive and judicial branches that defined how the data would be used and described how the Probation Central File was to be automated, the project began to move forward.

The criminal justice system is still a long way from completion, Keefe said. The $250,000 appropriation "will give us somewhere to put the Burroughs B-6700 system while programming work is completed by Data Architects, Burroughs' subcontractor in the project," he added.

The system is expected to be up and running with acceptance tests completed within about 18 months, he said.

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Mass. Makes Move in Haste, But May Soon Repent in Leisure

By Nancy French
Of the CW Staff

BOSTON – Massachusetts officials who moved the state's tax computer from a shared DP facility to function as a dedicated system to comply with "pending tax legislation" may soon find they acted in haste.

Neither the Tax Reform Act of 1976 nor the Internal Revenue Service (IRS) regulations that will implement it will contain new confidentiality requirements, according to congressional and IRS spokesmen.

The computer was moved at a cost of $20,500 when Tax Commissioner Owen L. Clarke was told by a congressional employee that confidentiality provisions contained in the Tax Reform Act could not be met in a shared DP facility.

The rules in question were those written to protect the confidentiality of federal tax return data the IRS provides on computer tape to states to help them locate residents who don't file state tax returns [CW, March 29].

In jeopardy was an estimated $10 million generated from such delinquent taxpayers, officials confirmed.

Although the computer had been moved to the central site only a few months before from a location where it had functioned as a dedicated system, it was moved back without waiting to learn what the ultimate IRS regulations would be.

Consolidation Urged

The story began some months ago when a report from a Management Task Force appointed by Gov. Michael S. Dukakis recommended consolidating the state's DP facilities. The consolidation measure, aimed at saving money in this revenue-starved state, was considered by the previous administration but tabled for reasons that were not explained, according to Roger Banville, director of the central DP facility.

The state's Univac 1100-10, which was being operated in the Tax Department, was ordered moved to the central facility by Administration Secretary John R. Buckley. There it would continue to be used for tax processing, but excess machine time would be used for other state functions.

Then Clarke learned from a staff member on the Joint Committee on Internal Revenue in Washington that the Tax Reform Act might affect these plans. The bill contained a clause permitting states "currently" sharing computers to continue to do so as long as Treasury Department regulations were observed, but did not mention anything about states that might wish to consolidate their DP operations in the future, Clarke explained.

The staff member interpreted the language as meaning that although states already sharing a system could continue to do so, states that were not would be prohibited from beginning the practice, Clarke explained.

Didn't Wait For Regulations

On the strength of that interpretation, according to Clarke, the decision was made to move the computer back, although the bill had not yet been signed nor had any IRS regulations been issued.

An IRS spokesman whose job it is to draft regulations to implement the new tax bill called the interpretation "incorrect." The rules, to be issued soon, will contain the same confidentiality safeguards presently in force for shared facilities; no dedicated systems will be required, he said.

Confidentiality rules presently permit states to use IRS exchange tapes as long as state tax department employees are present at all times during processing, the IRS spokesman explained.

As a result of the move, the state's central DP facility was stripped to only one system – a batch-oriented RCA Spectra 70/65 – to process all budget work for the controller, civil service personnel records and statutory retrieval for the legislature, to name only the major jobs, according to Banville.

While the Spectra 70 has communications and remote job entry capabilities, the data must be batch processed at night to update the files, he noted.

Short of computer power, DP officials have begun a search for a new system with data base capability, Banville said, adding "we've already had one meeting with the vendors and we're in the process of getting functional specs together so we can get the bids out by the end of the month."

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World rank as DP market: *Fourth*
1975 DP expenditures: *$2.7 Billion*
1975 imports from US: *$270 Million*
Rank as importer from US: *Third*

Computer Management is a monthly magazine recently purchased by Computerworld, Inc. Monthly circulation is 30,000.

COMPUTERWOCHE
Germany

World rank as DP market: *Third*
1975 DP expenditures: *$3.7 Billion*
1975 imports from US: *$274 Million*
Rank as importer from US: *Second*

Computerwoche is a weekly tabloid newspaper started by Computerworld, Inc. It has a circulation of 21,000 to the West German computer community.

SHUKAN COMPUTER
Japan

World rank as DP market: *Second*
1975 DP expenditures: *$4.6 Billion*
1975 imports from US: *$189 Million*
Rank as importer from US: *Fifth*

Shukan is a weekly tabloid newspaper, jointly owned by Computerworld and Dempa publications. Circulation is 35,000.

Zero-Un Informatique
France

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1975 imports from US: *$223 Million*
Rank as importer from US: *Fourth*

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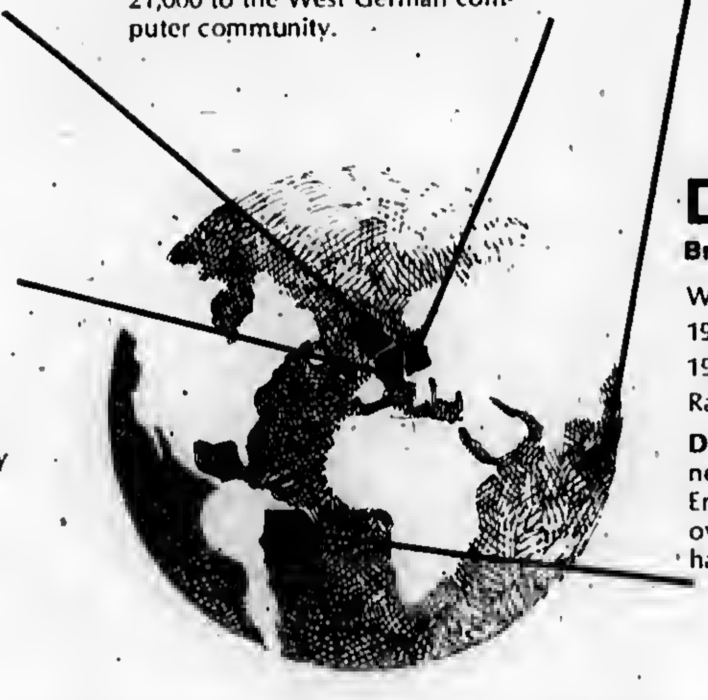

DATANEWS
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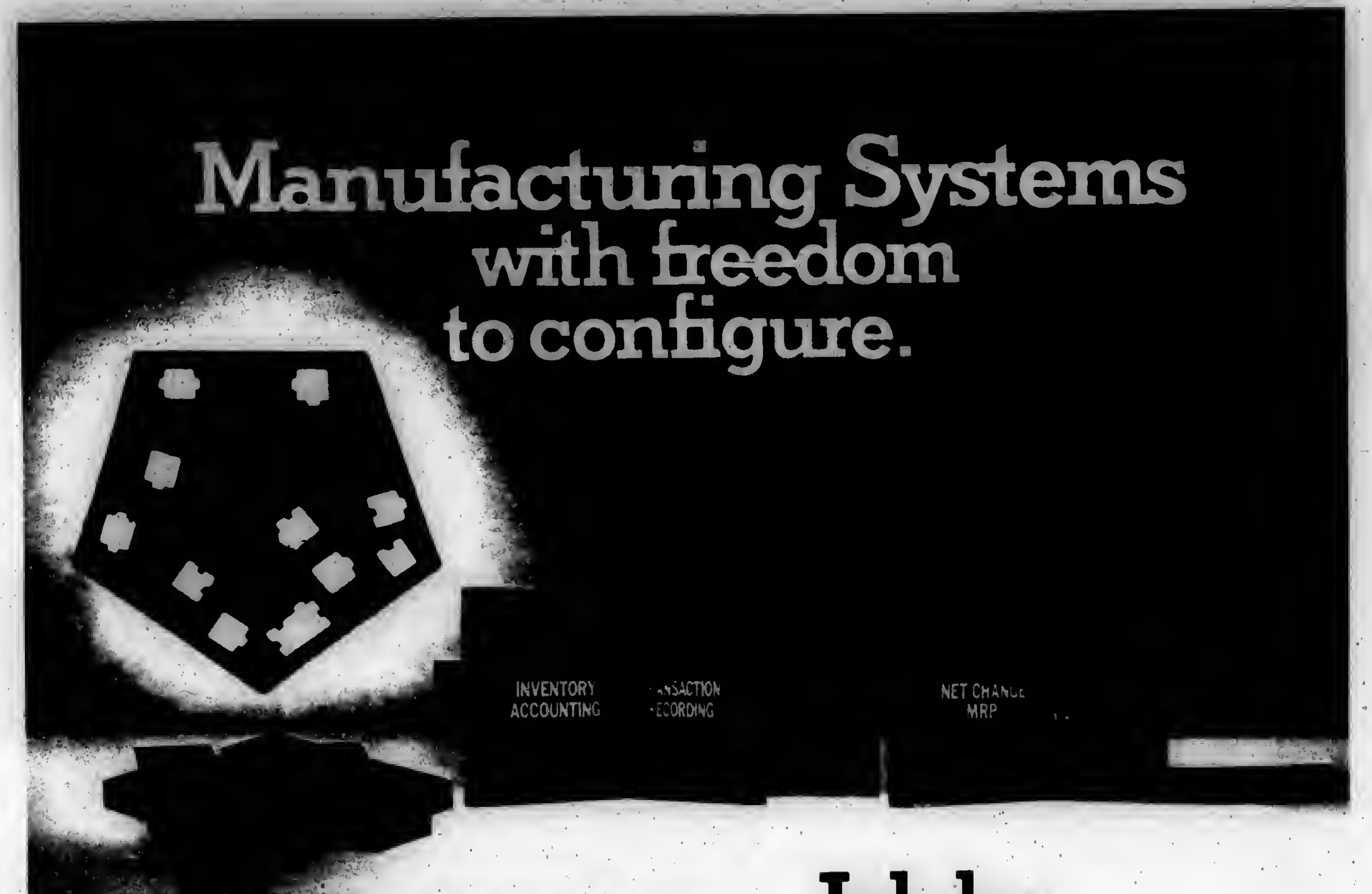

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Employee Motivation Seen Key To Outcome of DP Projects

By Ann Dooley
Of the CW Staff

CHICAGO – Unless workers on a DP project are motivated to do their jobs, the project itself will suffer or even fail, speakers at Info '76 agreed here recently.

Management style is the way "of getting your people to do the things you want" and, in order to achieve that, management has been turning toward the behavioral sciences, according to Lemuel Jones, an IBM instructor.

The Human Connection

Citing the theories of several behaviorists who contend people are motivated by various needs, Jones said it is up to management to encourage the fulfillment of those needs,

Behavior is closely linked to the job environment in several ways, Jones noted. People have various wants and needs; and as each level of need is satisfied, it is no longer a motivating factor, he explained.

Each level becomes more sophisticated; the last level is the need for self-actualization – living up to one's potential, according to Jones.

In relation to a work situation, this means the need for more job challenge and fulfillment, he explained.

Self-image is the most important force for actualization, Jones said. "Once managers realize workers have a self-image, they will do a much better job of managing them," he contended.

The role assigned to each worker should equal his self-image, Jones said. It is just as defeating to assign an unimportant task to someone with a high self-image as it is to assign an important task to someone with a low self-image, he added.

Encouragement or training from management might be required to build up an employee's weak self-image, he said.

A worker's self-image will promote a self-fulfilling prophecy, according to Jones. If an employee thinks he does a good job, he will do one; the expectation he, or his boss, has of himself will lead him to act accordingly, Jones explained.

Many managers still believe in the "Kick in the Pants" (Kita) theory of motivating employees, while others reward them with fringe benefits, but neither really motivates an employee to work better, Jones said.

A Pittsburgh survey showed achievement and recognition made workers happy while an increase in salary or fringe benefits only made them less unhappy, he noted. "Job enrichment doesn't mean more things to do; instead, it means changing the quality of the job."

Managers can improve work situations by encouraging workers to achieve their full capacity, by getting more feedback on management style, by delegating more responsibility and by implementing career planning and counseling, Jones said.

User Standpoint

Lloyd Epstein, manager of education for Cogna Systems Corp., approached motivation from a user standpoint, saying what is needed is total commitment to user involvement.

A project to put terminals in every installation of Swift Co., a meat processor, included feasibility studies, hands-on training for each person and extensive follow-up with the people at Swift. Two-way communication was encouraged and every effort was made to closely involve the client in the conception, design and implementation processes, Epstein said.

"The company felt the pride of ownership, which is a high motivator, and the client involvement created a commitment to the project," he recalled.

A mindful management is one which thinks about what people want, Ed Musselwhite, vice-president of Deltak, told the audience. "If there is no positive attention, they will accept negative attention; it goes on daily in industrial sabotage and projects which are endlessly delayed for no apparent reason," he said.

Emery Freight is a company that used positive reinforcement with dramatically successful results, according to Musselwhite. Instead of using the Kita philosophy, floor managers were told to praise and encourage the work of each individual.

Within a day, waste was significantly reduced and profits began a continued climb, he said.

MIT Jilted IBM, Trial Told

By Catherine Arnst
Of the CW Staff

NEW YORK – When MIT needed a more powerful computer for Project MAC, a time-sharing system brought up in the mid-1960s, it purchased a system from General Electric (GE) rather than IBM despite IBM's gift of a free computer some years earlier, according to Philip Morse, MIT professor emeritus.

In testimony at the U.S. vs. IBM antitrust trial here recently, Morse, director of MIT's Computational Center from 1957 to 1967, said he proposed IBM donate a 704 vacuum tube computer along with maintenance as "mutually advantageous to both of us."

The corporation saw other advantages in gratis installations at universities, trial documents entered earlier by the government showed. Free installations were believed valuable because they exposed management people to IBM computers at universities that had cooperative programs with the industry.

In addition, IBM assumed that, by offering equipment gratis, it would be in a preferred position with the receiver. A gratis installation at the University of Illinois had proved that assumption correct when the school later purchased more IBM equipment.

MIT, however, did not live up to IBM's expectations. When the school began Project MAC, it wanted a duplicate of its computer center system.

It needed a more advanced machine, however, and IBM was not far enough along in time-sharing developments to offer one, Morse testified.

IBM was "shocked and chagrined" that "any part of MIT would get a machine other than IBM's," Morse said.

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Industry leaders unite to organize DataComm 77
Leading data communications industry organizations have joined forces to make DATACOMM 77 the national focal point for the datacomm community. Conference organizers are the Association of Data Communications Users, Auerbach Publishers, Canadian Datasystems, Computer Decisions, Computerworld, DataComm User, Datamation and Infosystems.

DP Hit for Ignoring Corporate Decision-Making Needs

By Nancy French
Of the CW Staff

CHICAGO – The DP community has historically focused its attention on the current status of information and devoted very little attention to the information needed by top management for "strategic decision making."

Most management information systems (MIS) are only operating information systems – they tell what happened yesterday and what's happening today instead of what will happen tomorrow, according to Paul Schneider, vice-president of A.T. Kearney, Inc., a Chicago management consulting firm.

"Instead of focusing on what the cost impact of proposed legislation will be, for example, the typical [MIS] answers questions like 'How many orders did we receive yesterday?' and 'When do they have to be shipped?' " Schneider explained.

Orders are very important, but there will be no orders if management doesn't have access to information that answers questions like what impact new technology is going to have on the product line, he pointed out.

Other critical questions on the minds of top management include how changes in the equity market and the interest rate, for example, will affect the company's operation in the future, he said.

Equally important are answers to the questions raised by changes in competitors' product lines, he added.

Today's corporate executives are concerned about MIS because of the profit impact, but they don't like to turn to DP to get that information because DP doesn't have the answers, he told attendees.

Conceding that management is to some extent an art, Schneider said many executives can make decisions with less than the necessary information.

The artistic manager often functions well without the information he needs. Even if provided the information one would think he needs, the talented manager often chooses not the first choice suggested by a forecasting model but, rather, the fourth or fifth choice because of factors that cannot be quantified, Schneider indicated.

Assisting Top Management

Nevertheless, more can be done with DP to assist top management, and DP managers should urge their corporate higher-ups to invite them into the planning process – to let them know what information they will need to develop overtime so the DP department can avoid trying to throw together an MIS on a crash basis, he said.

The information management function still isn't being handled today; it's a future frontier, an opportunity, Schneider said.

The DPer of the future will know where to get the information his management will need to maintain flexible management objectives and to improve productivity in times of a capital crunch.

The DPer of the future should be able to help management recognize and exploit new areas of growth and anticipate changes in the economic system, he said.

Further, the DP department should be called upon to provide information that will assist top management in adjusting services to the changing demands of areas served by the company as well as help management take advantage of new products and new market opportunities, he said.

"Most of us grew up with the idea that the higher an individual was in the management structure, the less information he needed. This inverse relationship doesn't always work," Schneider said.

A DPer should be in tune with the personality and management style of the individual at the top of his firm, he said.

If he wants to know how many playpens are being purchased for the company's new day care center, the information provider must be able to provide it in the form he wants, Schneider concluded.

Bureau Negotiating To Stay in Business

OKLAHOMA CITY, Okla. – Losing a $30,000 per month account and owing $300,000 on a Honeywell 3200 may force Academy Computing Corp. here out of business.

The service bureau was doing $800,000 in business annually until January when Bellstar, an order tracking system it operated for AT&T, went in-house.

The system consisted of 250 terminals in 10 states and used 80% of Academy's computing power, according to Dr. James R. Sherburn, Academy's president.

Academy had been operating Bellstar since 1968. During last year's recession, however, AT&T decided it could operate the system cheaper itself, Sherburn said, adding he disagreed with AT&T.

AT&T accomplished the changeover in six months, leaving Academy with a large computer it didn't need and couldn't afford.

Honeywell, however, refused to renegotiate Academy's contract unless the vendor had a secured note guaranteed by a director of the service bureau. Sherburn said such a note cannot be provided.

The firm was officially placed in default by Honeywell early last month and the two companies started final negotiations about two weeks later. If no agreement can be reached, Honeywell will repossess the system and Academy will be forced to liquidate.

"Honeywell is not trying to put us out of business. It's merely a financial consideration," Sherburn said. "There are a lot of computer companies out there in our situation, I guess."

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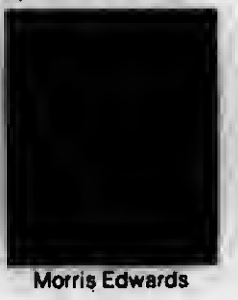
Dr. William A. Saxton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Taxpayers Sue School District Over 370 Acquisition

By John P. Hebert
Of the CW Staff

CONCORD, Calif. – The Mt. Diablo Unified School District may have to give up its IBM 370/125 if taxpayers here win a class action suit filed against the school district.

Scheduled for a hearing Jan. 17, the suit charges the 370/125 was obtained to replace an IBM 1401 without competitive bidding and with funds raised for another purpose.

Stuart A. Safine, attorney for the taxpayer plaintiffs, said the school's 1973 request for proposal (RFP) described the system from IBM 370/125 specifications.

Further, the funds used to purchase the system came from a 1968 $25 million bond measure intended for "supplying equipment or apparatus of a permanent nature" for the school building and grounds, not for the purchase of a computer system, he said.

Smith vs. Mt. Diablo Unified School District et al. was brought by Jerry Smith in May 1974 on grounds of misuse of the 1968 bond money [CW, July 17, 1974].

The case has bounced back and forth between courts here for the past two years on technicalities. In December 1974, a superior court judge threw out the case, stating Smith hadn't filed the suit before deadline.

But last March, the California Court of Appeals ruled the time limit doesn't apply to public agencies sued by taxpayers.

Officials Denied Information

In the suit, Smith alleged he sought information on the bid proposal in 1974, but school district officials "wouldn't give him information on how they based their [purchase] decision" or give him a copy of the contract, Safine said.

"They wouldn't show him anything." Smith, who is just "an interested taxpayer, screamed and yelled" and brought the case to court, the attorney added.

Although there is no suit against IBM itself, the suit asks IBM to take back the 370/125 and refund the $565,229 purchase price to the school district. Safine said he is also hoping to recover some of the maintenance costs incurred by the school district's DP center over the past few years, but that is not the object of the case.

During the discovery portion of the suit, the court found a Sept. 5, 1972 letter sent by James Merrihew, superintendent of schools at the time of the system's purchase, to IBM salesman James Obendorf asking him to place a 370/135 on order unless a Model 125 would be available before the requested delivery date, Safine said.

The IBM salesman is alleged to have given the school district's DP manager a specification sheet for the Model 125 configuration and to have asked that the IBM name and model numbers be dropped from the RFP.

Bid proposals from Burroughs Corp., Honeywell, Inc. and Univac were not considered because they could not meet the specifications set forth, including the delivery schedule, according to Safine.

Vendors and lessors of computer mainframes who bid on the system later wrote to the school saying it was clear the school district obviously wanted an IBM system, he added.

'Wired From the Beginning'

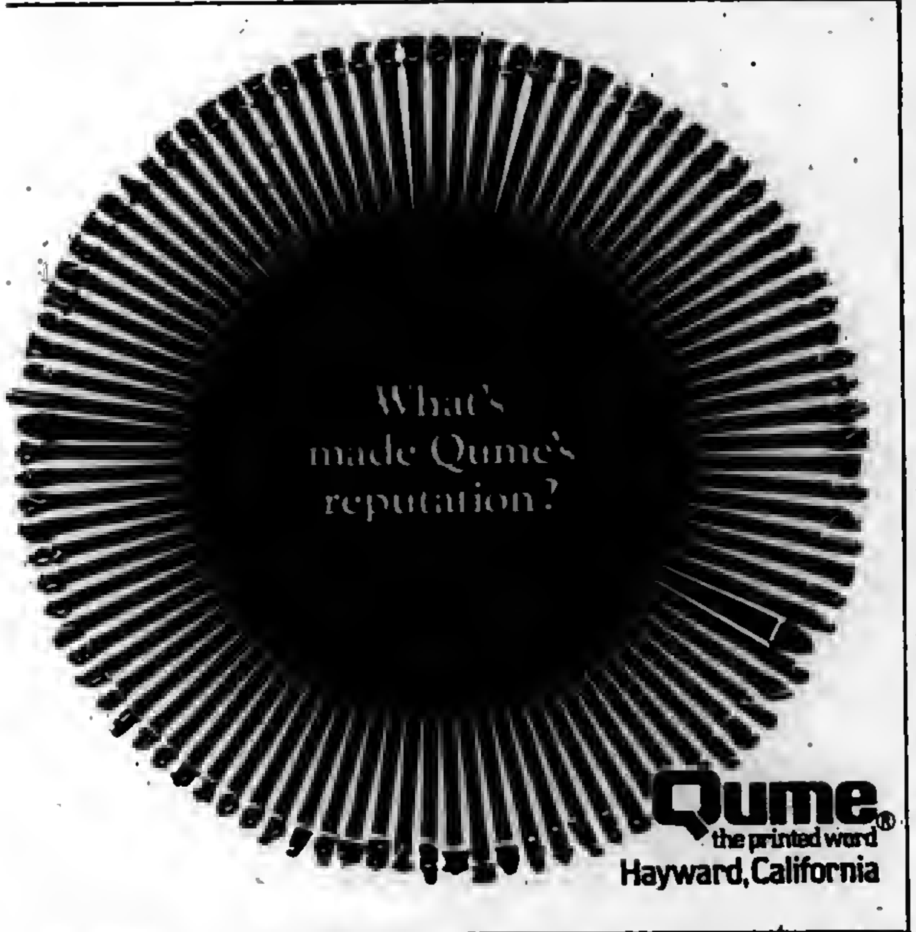
IBM installed the system and had it operating seven days after winning the contract, according to the taxpayers' attorney. IBM had specified a 10-day delivery schedule in its bid proposal, while the other three vendors submitted delivery dates of six months to one year, he said.

During the discovery portion of the suit, it was also found IBM had built the system for the school district before the RFP was issued and was merely waiting for the contract to be awarded, he said.

In addition, it was found the school district redesigned the computer room to accommodate the 370/125, Safine said, adding "I feel we can prove this thing was wired from the beginning."

And, he noted, school district officials admitted in the pretrial deposition it didn't need a machine with the computational capabilities of an IBM 370/125.

"We only want to get the school district's money back. We don't want to go after anybody in particular, or IBM for that matter," Safine said.



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IBM Scientists Develop 'Supervacuum'

YORKTOWN HEIGHTS, N.Y. – As electronic circuits become smaller and smaller, new techniques are needed to apply ever thinner layers of materials to chips that will form the computer components of the future.

Scientists at IBM's Thomas J. Watson Research Center here have designed and built a vacuum chamber that enables them to form and study layers of material as thin as one atom, according to an IBM spokesman.

The chamber, which measures one cubic foot, is large enough to hold several experiments in a vacuum that approaches the emptiness of interstellar space, according to IBM.

The "supervacuum" is achieved by cooling the chamber to only a few degrees above absolute zero.

Observing Changes

To make computer chips effective, the thin layers of circuitry must be preserved over extended periods of time. In a test situation, scientists must be able to observe these layers and any changes that occur in the layer's electronic properties, according to Dr. William A. Thompson. In a normal vacuum chamber, the surface layers don't stay the same long enough to get a good analysis, he explained.

The supervacuum chamber enables researchers to do experiments over a two- or three-day period and then preserve the surface and analyze it again a month later, Thompson said.

Although the chamber runs at very low temperatures, it contains a unit hot enough to melt and evaporate materials such as lead onto test surfaces.

"One of the advantages of the chamber is that we can evaporate slowly without worrying about contamination. We get very good thickness control and surface longevity," Thompson said.

Designing the evaporator was one of the major tasks in the development of the IBM vacuum chamber. To preserve the low pressure of the chamber but, at the same time, allow the evaporator to function at a high temperature, it was necessary to surround the evaporator with four heat-insulating shields – two inner shields of tantalum and two outer shields of copper.

The chamber usually stays sealed for several months, during which many experiments are performed.

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Request for Proposal No. 268 for the purchase of an impact printer capable of interfacing with a Univac Uniscope 200 terminal.
Request for Proposal No. 269 for the lease or purchase of a software package that will edit in detail vehicle identification numbers (VIN) for both foreign and domestic vehicles.
Request for Proposal No. 270 for the lease or purchase of a central processing unit upgrade to replace two existing IBM 370/155 systems to include either a multi-processor (MP) 158 system and sale of 155's or an attached processor (AP) 158 system, sale of one 155 and purchase of a DAT (Dynamic Address Translation) feature for one 370/155.

Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities.

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With DP Performed at the Source

Future Shops Seen Coordinating Distributed Processing

By Nancy French
Of the CW Staff

CHICAGO – The typical DP department of the future will function as an internal consultant and coordinate DP efforts being undertaken by line departments, according to W. Harry Vickers, vice-president of Entrex, Inc.'s Market Development and Support Division.

In such an environment where processing is done "at the source," the data base administrator will specify the format of key data elements in all source data processing systems and will also specify the format of all intercomputer data transfers, he predicted.

Vickers urged DP managers as well as top management to be prepared. "If you wait until source data processing sneaks up on you, you'll end up with a hodgepodge of equipment with no one place to go for knowledge about overall operations" and with little flexibility, he said.

Distributed Processing Trend

Many trends already favor a move to distributed processing, Vickers told attendees at the recent Info '76 conference here.

Hardware cost has been in a very steep decline for a number of years and that trend is likely to continue; he said. The microprocessor has brought about dramatic cost improvements and over the next few years will produce considerable speed improvements, he added.

The advent of semiconductor memory has pushed down the prices of all forms of main memory, and disk storage costs have dropped by a factor of 25 since 1970. Data communications costs have also dropped, although not nearly as dramatically as computer hardware.

These declines are occurring in the face of labor costs which are rising an average of 8% to 10% annually, he pointed out.

"In many places it is hard to find, train and keep quality people. The economics are saying: 'Use more hardware if it will save labor or if it will make labor more efficient or more effective," he said.

People are growing more comfortable with the computer, he added, noting students are taught programming as a standard subject in most high schools and colleges. Further, with the maturation of software, minicomputers have many of the features only a mainframe had just a few years ago.

Another factor in the trend toward distributed processing is the movement to profit-and-loss-oriented department management, Vickers said. When a department manager becomes "sensitive to profit," he begins to look for tools to make his operation more efficient, he explained.

Insistence on Simplicity

The company president faced with a proposal for distributed processing should insist on simplicity so he, as well as the auditors and line managers, can understand it on more than a superficial level, Vickers said.

While it's not necessary to know how to program a whole application, line managers should know how the application works and how the data is structured so they can determine which questions will be easy to answer and which will be difficult, he explained.

A line manager might want to know something he thinks is simple, such as the top 10 overdue accounts, the 10 largest orders for the week or the 10 employees with the highest absenteeism rate, he suggested, adding this type of question will come up many times but usually "after the application is programmed."

It makes little difference to the manager if the page has a nice heading or the spacing is neat or even if he gets more than 10 names. He wants the information and he usually wants it fast, Vickers said.

There are source data processing systems today that will provide 95% of the functionality of a mumbo-jumbo system, but with a structure that can be explained to a non-DPer in terms of three concepts: a file, an index and a transaction, he said.

As for DP managers, Vickers recommended they regard source data processing "as an opportunity, not a threat." Some seem to be afraid it will put them out of jobs, he noted.

DPers should plan carefully and, as the first project, "distribute something that shows very tangible progress in a very short time."

Vickers also suggested involving the line departments in programming some of the reports. This will not only give them the ability to generate follow-on reports, but also increase their enthusiasm, he said.

FAA Upgrading Traffic Control System

SILVER SPRING, Md. – In an effort to improve its Enroute air traffic control system, the Federal Aviation Administration (FAA) is implementing additional software with upgrades done by Compnter Sciences Corp. (CSC).

These features include a "flight plan probe" which automatically compares each flight plan with all others entered in the computer. The first aircraft to claim space will have precedence over the later entries.

"Conflict resolution" is a program to handle flight plan conflicts. Air traffic controllers will be able to view a display screen to compare possible solutions to conflicting demands for air space and reroute aircraft where necessary.

The controller might inform one pilot to reduce speed or altitude until a conflict has passed, according to a CSC spokesman.

A third capability is "command message automation," a nonemergency means of delivering routine messages from controllers to pilots through computerized voice or teleprinters.

The last feature will be "enroute traffic metering" to compute and improve the timing of aircraft arrivals at busy airports and adjust the flow of traffic into an airport.

These capabilities will enable the Enroute system to better utilize existing computers and avoid the expense of new equipment while increasing safety, especially near busy airports, according to Arturo Silvestrini, president of CSC's System Sciences Division.

The CSC software was designed to interface with the computers of the FAA's automated terminal system to optimize maneuver time and holding patterns that contribute to flight safety and fuel savings, Silvestrini said.

The initial safety features will cost taxpayers about $1.5 million, CSC said.

Anti-Puncher Defeated In Recent Election

Special to Computerworld

SEATTLE – A candidate who proposed to "abolish the punch-card voter system" in the state of Washington went down to defeat in the recent election.

Bob Corcoran, a Democrat running for Secretary of State, had called the computerized election procedures now used by 45% of Washington residents "dangerous and error-prone." He cited 1975 election results in which "one county's figures were totally wrong with a two-day lag in correcting the results" and in which "34,785 votes were not tallied in 12 other counties."

Despite Corcoran's charges, election officials have found punch-card voting to be no more "dangerous or error-prone" than voting on lever machines or with paper ballots.

The punch-card voting issue was the sole plank in Corcoran's platform, according to the official state voters' pamphlet. Victorious candidate Bruce Chapman, a Republican and the incumbent, did not mention the issue in the pamphlet.

The only other candidate for Secretary of State to submit a platform, Lucie Griswold of the Owl party, passed over the punch-card ballot issue in favor of opposing "bed wetting" and "postnasal drip."

The history of punch-card use in Washington, which began in about 1971, has been marred by such incidents as the resignation of the Superintendent of Elections for the state's most populous county in 1973 because of the "tension and pressure" created by the system.

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Editorial

Promise and Peril

The recent introduction by IBM of its Advanced Communications Function (ACF) [CW, Nov. 15] puts an entirely new perspective on the company's Systems Network Architecture (SNA).

Up to now, SNA capabilities were limited to single-mainframe systems supporting terminals in various network configurations. Using the benefit of its flawless hindsight, IBM now reveals these systems really were single-domain networks.

The significance of a single-domain network is important only as it relates to the multiple-domain network. And with the introduction of the latter term, IBM finally unveils the first major concept that helps to explain what SNA is all about.

Bearing in mind that some of these latest concepts remain to be demonstrated, IBM now reveals the ACF framework will allow terminals in one CPU network to access applications programs from a "foreign" CPU network.

In other words, terminal domains can be defined which span multiple mainframes and, as long as a terminal is duly authorized within the predefined limits, it will be able to access a number of CPUs.

These so-called "cross-domain connections" will truly expand the networking capabilities of IBM teleprocessing users. And the multiple CPU network concepts appear to set the stage for data communications users who will be accessing multiple network facilities to access multiple data bases at distributed DP sites.

The IBM announcement holds much promise together with an unusual amount of caution to be carefully heeded by users.

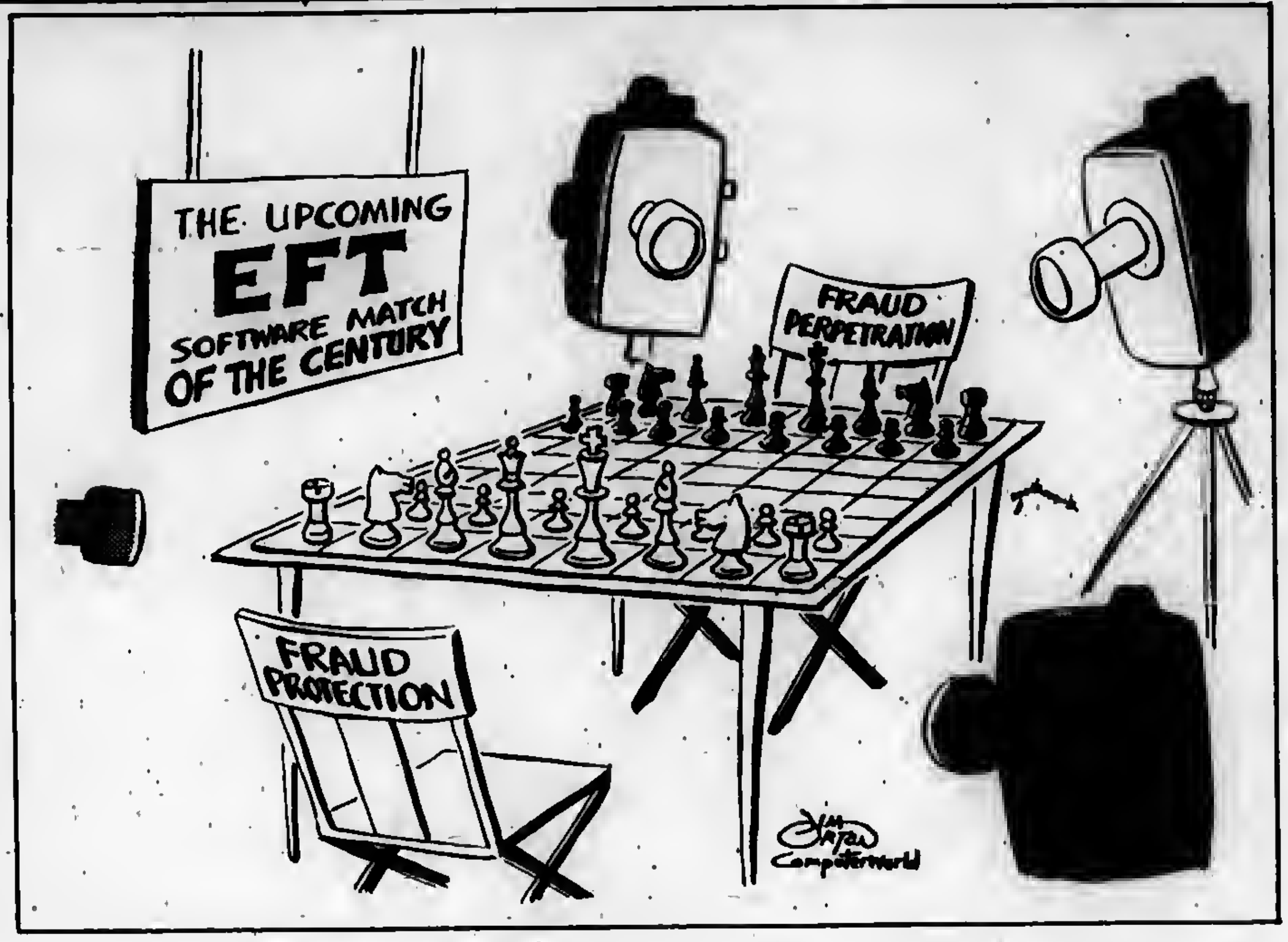
Until now, the SNA architecture has been an underwhelming success. This is mainly because IBM created an immensely complex operating environment which includes significant cost and configuration upheaval for those users that choose to implement it.

Previous SNA implementations have encountered a rocky road because many of the capabilities were announced before they were truly perfected. There are still precious few large-scale networks operating under SNA with IBM's Synchronous Data Link Control.

The ACF capabilities are the most impressive to date. They will become available next year. And if they operate as smoothly as advertised, the days of distributed data base networking using dispersed terminal subsystems and multiple CPUs will have taken a significant step forward.

It will be very important for users to carefully monitor additional technical details as they unfold from IBM. It will also be very interesting to see how soon there are test sites implementing the new SNA concepts on a large scale.

It could be very exciting.



Letters to the Editor

Schechter Showed Inventiveness And a Degree of Inaccuracy

In his article, "Storage of Data Information Lacks Inventiveness" [CW, Nov. 8], David Schechter has shown inventiveness, albeit inaccuracy.

His statement that centuries have 25 leap-year days was only partly correct, since century years not divisible by 400 are not leap years, e.g. 1900.

We have invented a date, dubbed Mega, which is the number of days since the beginning of the Common Era (A.D.). This is based on an assumption that the Common Era began on Jan. 1, 0000, according to today's Gregorian calendar.

July 4, 1976 becomes 721,905, which stores very nicely in four bytes, packed decimal. The Mega date transcends both years and centuries and can easily be used to calculate elapsed days and the day of the week.

Since the calculation to obtain the Mega date is a little complex, we use a subprogram to convert any of five date forms to any of six date forms, including Mega.

Larry Runtsch
Systems Programmer

Geo. A. Hormel & Co.
Austin, Minn.

Excellent Date Handling Method

David Schechter proposed an excellent method of handling calendar dates for the entire century. Hopefully, *Computerworld* will keep the idea alive by noting any pioneer applications.

Nonetheless, I strongly urge that Schechter's meaningless acronym, FDN (five-digit number) be replaced by DN (date number).

Kenneth K. Klingensmith

Cromwell, Conn.

Only Good for 23 More Years

David Schechter's article is commendable, but I believe his formula is only good for 23 more years.

I propose the following simple change to his basic premise: There are a fixed number of days in a 10,000-year period, namely 3,650,000 plus 2,500 leap-year days.

Thus, any date between Jan. 1, 0000 and Dec. 31, 9999 can be expressed as a seven-digit number (SDN).

SDN = (YYYY * 365.25) - .25 + DDD

In fact, an SDN would suffice for the years 0000 through about 27377.

Donald J. Ramig

Madison, Wis.

How Many Leap Years in 100?

It was the mistaken notion that there are 25 leap years in a century that led me to notice the error in David Schechter's five-digit number (FDN) formula.

For those concerned about the 21st century or truly archival data of this century, the correct formula is:

FDN = Integer ((YY * 365.25) - .25) + DDD

With this minor correction, you will be easily able to determine the correct number of days that items from the year 1900 have been on backorder.

Edward C. Imperatore

New York, N.Y.

(Other letters on Page 16.)

Data Past

Five Years Ago
Nov. 24, 1971

LAS VEGAS – About 17,000 people attended the 20th anniversary of the Fall Joint Computer Conference in this city last week and 4,100 conference registrants participated in sessions on "Computers and the Quality of Life," the conference theme.

President Richard M. Nixon, in a telegram, congratulated the American Federation of Information Processing Societies, the conference sponsor, on the theme, noting it "reflects the challenge of the next 20 years."

– – –

LAS VEGAS – Potter Instrument Co. led the product announcements at the Fall Joint Computer Conference with a working plug-compatible IBM 3330 replacement drive that interfaced directly with IBM's 3830 controller. The disk storage system, the DD 4330, was cheaper and faster than its IBM counterpart, Potter said. The single-drive spindle was priced at $550/mo on a one-year lease and the cost of the double-drive version was $1,030/mo.

Eight Years Ago
Nov. 27, 1968

WASHINGTON, D.C. – A spokesman for the General Services Administration (GSA) told a congressional committee here that if the GSA did not receive cost data from the computer industry voluntarily next year, it would promote legislation to force the industry to provide it.

Lawson B. Knott Jr., GSA administrator of general services, said while the Truth in Negotiations Act called for the details to be provided, the computer industry refused.

– – –

WALTHAM, Mass. – A desk-top computer display which handled both drawings and characters was introduced by Computer Displays, Inc. Designed to operate over standard telephone lines, the Advanced Remote Display Station sold for $12,750. It was said to be the first desk-top system that had both assembly drawing and full-vector capability.

Against Long-Established Usage

Schechter Gave Incorrect Definition of the Julian Date

By Peter F. Klammer
Special to Computerworld

Does one call a programmer a computer? Or a card reader a processor? No, these words have particular meanings in the realm of DP jargon; they have not been just carelessly adopted.

It is one thing to assign more precise rolea to words used in a field of work or even to invent a few words to match our newly invented concepts, but lt is quite another thing to misuse existing language that already has well-defined usage.

That is why I take such strong exception to David Schechter's description of the term "Julian" date in the Nov. 8 *Computerworld*. The definition he gave is incorrect and runs against long-established usage in the scientific arena.

First Modern Calender

The back end sheet of this year's *Success* desk calendar explained the Julian calendar was "the first modern calendar" with a leap year, established in 45 B.C. by Julius Caesar.

Although it was "an enormous lmprovement over all previous systems," it ran a little slow, by ahout 11 minutes, 12.2 seconds per year or 3 days, 2 hours, 41 minutes and 20 seconds every four centuries.

Of course, this doesn't mean the sun gets further and further from zenith on successive noons, as would be the case if one's wristwatch were allowed to accumulate such an error.

Out of Kilter

What it does mean is that the system of counting days, months and years gets further out of kilter relative to the seasons – marked by the equinoxes and solstices.

Without a correction, the shortest day of the year would be Dec. 21, then Dec. 20 and so on, until a few millenia later the middle of the northern-hemisphere winter would occur during September or October, and Dec. 22 would mark the start of spring.

Gregorian Leap Year Rule

Sixteenth-century stargazers were ahle to measure this error and they gave us our current Gregorian calendar. A calendar correction "was done in 1582 by Pope Gregory XIII," skipping Oct. 5-14. (Imagine what that would do to your payroll system – and your third-shift operator bewails the loss of an hour when the clocks go off Daylight Savings Time.)

> *'I take strong exception to David Schechter's description of the term "Julian" date . . . The definition he gave is incorrect and runs against long-established usage in the scientific arena.'*

Reader Commentary

To take up part of the error, the new Gregorian Leap Year rule provides for dropping a day from every centessimal year (ending in 00) whose number cannot be divided by 400.

That takes care of three days per four centuries, leaving something like one day per 4,000 years to be compensated for in the future; hut it's quite likely the earth's rotation is slowing down enough that a new leap year rule will have to be instituted by then.

Note that not all the world adopted the Gregorian calendar at the same time. England and the American Colonies switched in 1752, by which time the error had accumulated to 11 days: Sept. 3-12, 1752 do not exist in the English-speaking world.

So even though it was Feb. 11 when George Washington was born in 1732, his birthday exactly 40 years hence was Feb. 22, 1772.

Since both the Julian and Gregorian calendars were in use simultaneously in different parts of the world," dates preceding the change are sometimes [suffixed] OS, for Old Style."

Adopted by Astronomers

Data processing folks were not the first to see the advantage of a day-numbering system that would allow easier calendar arithmetic. In fact, according to Van Nostrand'a *Scientiflc Encyclopedia, Fourth Edltion*, 1968, the term "Julian Day" refers to a system astronomers have adopted, "a system of chronological reckoning, using merely the mean solar day as a unit."

Further, "according to a system first proposed in 1582 . . . a date is expressed as the number of daya elapsed since the beginning of an arbitrary 'Julian era', Jan. 1, 4713 B.C."

Astronomers go on to put decimal places hehind the day number instead of stating hours, minutes and seconds. "Thus, an event occurring at 2 hours, 43 minutes, 34.6 seconds p.m., Eastern Standard Time, on Jan. 24, 1937 would be recorded as . . . J.D. 2,428,558.32193."

The decimal part, of course, is relative to Greenwich Mean Time.

Webster's *Third New International Dictionary*, 1971, concurred, defining the term "Julian day number" as "the number of a day in the Julian day calendar" (as 2,436,934 for Jan. 1, 1960).

Here a mystery arises: every algorithm I have found ylelda 2,436,935 for thia date. I have checked four other references such as Van Nostrand's and I think lt is simply an error. Off hy one again.

'Day of Year'

What shall we call the YY/DDD notation, then? I would suggest "Year and Day of the Year."

The term "serial day" is amblguous, leaving the question, "Serial within what?" "Day of Year" is unamhiguous, and one can answer "What day of the year is it?" by looking at the lower left corner of a better desk calendar.

This terminology also fits well with "day of the week" and "day of the month" terminologies.

Many good algorithms have already been published in *Collected Algorithms From CACM and Communications of the ACM* to convert Gregorian dates to other date systems.

I prefer to use Julian dates unless I must be very atingy with space. A signed 32-bit integer will cover dates through nearly the 50,000th century, which is enough for almost any application but a Star Trek concordance.

Klammer is senlor programmer/analyst at the Kansas City (Kan.) Department of Planning and Development.

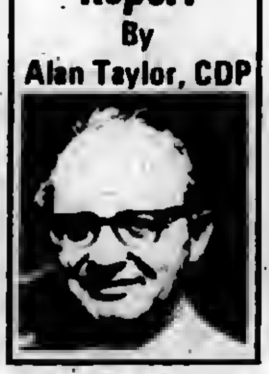
With the New Role of the Auditor

DPers Must Get Ready Now for Real Data Base Life

When the National Bureau of Standards (NBS) was getting ready to publish NBS Special Publication 451, "Data Base Directions – The Next Steps," earlier this year, it had the delightful idea of showing the relationships between various areas by means of a jigsaw puzzle.

Regulationa (which referred to government regulations and their impact) were shown as the chin and mouth – whlch appeared somewhat appropriate, all things considered. Technology was shown as the neck, on which everything else was based – which again was quite well thought out. Audit was allocated both the eyes and the nose – and that I found interesting.

The Taylor Report
By
Alan Taylor, CDP



Why a Nose?

It is easy to see why the eyes were allocated to audit operations. It looks at what is going on by inspection. This is its responsibility – and it requires eyes.

But why a nose? What ls the symbolic function of the nose as seen hy the NBS?

The answer came out in the audit part of the report. Here it was noted the auditors workshop reviewed prohlems which it felt will occur in the next five years.

The auditors did not simply look at the problems that are currently known; rather, they went ahead and sniffed problems that are not here yet.

The auditors were investigators here, rather than inspectors – and did a pretty good job of it too.

So the illustration of the auditors having the investigational smelling-out nose as weli as the inspecting eyes was, in the circumstances, quite appropriate.

Auditors Looked Forward

In their investigation, the auditors noticed how fragile the data-based corporations were and how the increased concentration and reduced redundancy of data made it quite foreseeahle that, owing to human error, a corporation could be simply wiped out.

They particularly rejected the concept that the chance of such a disaster wiping out a data base is so remote an auditor might not have the ohligation to report any case where such a possibility existed.

More to the point, the auditors specificaliy differentiated the data base/nondata hase situations at this point.

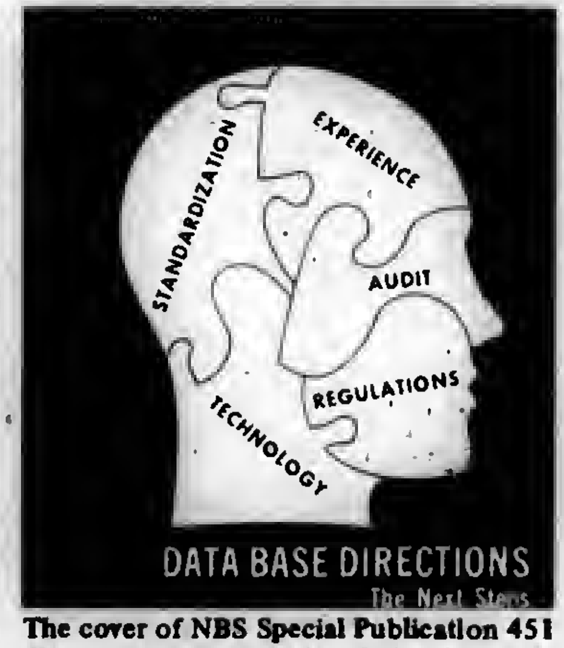
From their point of view, the move into data bases makes it apparently ohligatory for auditors to investigate areas where they previously did not need to go – in this case, into the effectiveness of data base recovery areas.

From their statements, there was a consensus the depth of danger was such that the auditor would not merely investigate the matter, but would also have to formally report any danger situations – not just push the matter under the rug in some working-paper notation or comment about the advantages of stricter controls, tighter management, etc.

The panel listed various integrity considerations, which certainly go weli beyond hackup when someone sends all the disks to a laundromat or similarly destroys the material.

Security, accuracy controls and the quality of data held in the data base are all in the auditor's mind when the utmost scrutiny is necessary.

When data is recorded only once, this recording has to then be used for all subsequent use and the validation of the "initial step," i.e., the original entry, will have to be checked by the auditor as being as extensive as possihle, the auditors pointed out. And that is going to cost more money, you can be sure.



The cover of NBS Special Publication 451 illustrates the new role of the data base auditor as investigator.

Similarly, the auditors called for the auditors to see that the data base has self-diagnosing capahilities to find inaccurate data. They want such a system to always include provisions for the system to internally evaluate and test its own accuracy.

Now, that is not present – nor does lt need to be – in nondata hase systems.

Read It Yourself

Read the report for yourself – and think about what it really means and what new aspects have added to current safeguards when a system goes data base.

After reading it, think about what it really means to prepare for the new environment. How many programmers or analysts know how to design input suitable for automatic self-diagnosis?

How many installations have sufficient control over new applications to ensure data that was originally accurate enough for all contemplated uses is not later used for a purpose for which it isn't properly edited?

That's a whole new operational standard for DP to live up to.

If half of this report is correct, we will have to review any ideas that we have on the true costs of conversion to data hases.

It is not like converting to multiprogramming or operating systems was because there the individual programs remained logically independent and any problems were effectively isolated. No longer is that true.

So now it is up to us to get ready for real data base life, not just the experimental efforts that appear to be data bases.

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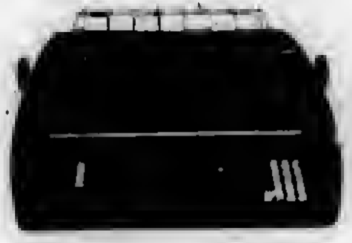

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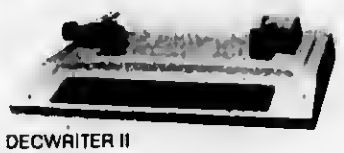

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Letters to the Editor

Honeywell Not Selling At Garage Sale Prices

Herb Grosch, in "DP Fairy Tale Has Three Dwarfs Left" [CW, Nov. 1], stated "Honeywell is having a garage sale." If this is true, Honeywell is certainly not selling its equipment or services at garage sale prices.

Now, I am no great lover of Honeywell management, but I do believe it has put out and is still putting out some very good and reliable equipment. I am very satisfied with the Honeywell equipment we have and am quite proud of the things we are doing with it.

In a previous column, "Into the Act" [CW, Mar. 1, 1976], Grosch said things were looking pretty good at Honeywell with the advent of Level 6. Now he completely reversed this position without explanation, which leads me to ask: Will the real fairy tale please stand up?

Michael P. Eiseman
Vice-President
Revere Electric Supply Co.
Chicago, Ill.

Mysterious Results in '89

David Schechter's five-digit number (FDN) technique [CW, Nov. 8], which we call day of century (DOC), eliminates end-of-decade problems such as the January 1970 disasters and reduces the end-of-century problems – January 2000 will be a good month to vacation in Antarctica.

However, using two bytes to store day-of-century dates in the IBM 370, as Schechter suggested, will produce some mysterious results around 1989.

IBM 370 binary arithmetic operations treat the high-order bit of 2-byte data as the sign of the number (0 for positive, 1 for negative). Only 15 bits are used for the magnitude of the number, giving a maximum of 32767.

It appears Schechter's will have negative dates after Sept. 17, 1989 (32767).

A full word (four bytes) on the IBM 370 permits a maximum number over two billion. Using a full word, you can set your base date to the first day of our calendar (the birth of Christ, if you will), and your date processing routines should remain valid for a long time.

Joseph W. Begasse
Consolidated Edison Co.
of New York, Inc.
New York, N.Y.

Say It Ain't So

The Social Security Administration said a new tape mounting and control system will save about $1 million per year [CW, Oct. 18]. As I interpret the figures, it looks more like $600,000.

The estimate was based on a study of the old system from June 1 to July 15 and on the new system from July 16 to Aug. 31. Both studies covered three daily shifts, Monday through Friday.

My problem is that there is no explanation of the holiday on Monday, July 5, during the old system study.

If no other day was used, the old system covered 32 days and the increase was 12.7 jobs per day, or about 66% of their figure.

Please tell me they're OK, I'm not OK, and make me a happy taxpayer.

Stephen D. Barry
Winchester, Mass.

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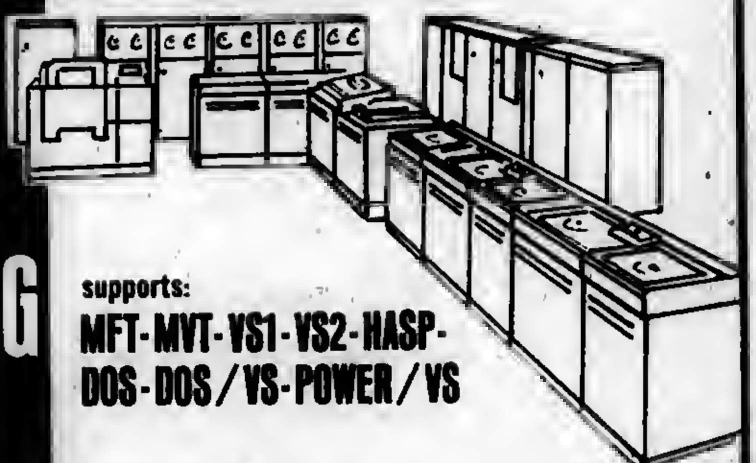

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CPEUG Keynoter Says

Microprocessor Revolution Changing Focus of CPE

By Don Leavitt
Of the CW Staff

SAN DIEGO – The problem faced by computer performance evaluation (CPE) is not being changed by the microprocessor revolution, but the point at which the problem is attacked is changing, according to Seymour Jeffery of the National Bureau of Standards.

Keynoting this year's meeting of the CPE Users Group (CPEUG) here recently, Jeffrey said CPE, "properly understood and applied," has always been concerned with finding better and more economical ways for users to satisfy their DP needs."

And the only way to do that, he added, is to understand the technology and to understand the application well enough to find a cost-effective fit between the available equipment and the need.

In the past and even today in working with general-purpose mainframes, "CPE has had to second-guess systems programmers, operators and applications programmers. In the future," he continued, with micro-based systems "we will probably find it more useful to second-guess the systems analyst and the systems designer."

Economics Doubtful

The economics of computing with microprocessors has begun to raise "considerable doubts" about the cost-effectiveness of end-user CPE studies "and these doubts are more likely to increase than to go away" as micros become more prevalent, Jeffery told the group.

Traditional CPE developed as it did because the physical size and environmental requirements of computer systems made it natural to bring the workload to the system, he noted. In turn, centralized CPU sites maximized both the ability to make changes and the potential for large payoffs in increased efficiency, he said.

"But what happens to this way of thinking," he asked, "when the 'natural' dynamics no longer apply – when, through lower costs and vastly reduced size, the computer goes to where the workload is, instead of the other way around?"

The implication of such a trend on CPE technology is "devastating," Jeffery said. The dispersion of computer power across a user community "would raise the cost of conventional measurements well beyond acceptable levels," he added.

Performance measurement and tuning came into prominence only after operating systems became "an art form" in the mid-1960s and end users "finally became convinced technology had truly left them in its tracks," Jeffery said in recalling the history of CPE.

Computers had always been fast, but early users saw them doing one recognizable workload step at a time. Multiprogramming operating systems changed all that by doing parts of several different tasks concurrently "in order to increase the utilization of an expensive CPU," he recalled.

The operating system itself grew and developed "an ever-increasing need for hardware resources" and, in time, CPE emerged as an attempt to unravel the multiprogramming mystery and impose "some measure of control" over a wasteful resource, he continued.

But now, with micros, operating systems may become completely unnecessary, Jeffery believes. "In contrast to the complexity of multiprogramming systems, microprocessors are models of regularity and simplicity," he said.

"Where multiprogramming baffled users, micros intrigue them: in place of the alienation that came from excluding users from the computer room, micros offer availability, convenience and familiarity," he added.

Without complex operating systems, the end user's need to measure hardware or software performance "virtually disappears." The need to build a good system, however, takes on added importance in micro-based systems that aren't expected to be tuned once they are in place, Jeffery said.

Good Design Seen Key to On-Line System

By Don Leavitt
Of the CW Staff

CINCINNATI – To get the most out of an on-line system, users have to design for performance and then measure the attained performance and make useful adjustments, according to a systems engineer for Cincom Systems, Inc.

Leading a technical session at the recent Knock-About, or Cincom users group meeting, Jon Waters said the design phase should be based on proven, efficient techniques.

But more important, he added, is the setting of goals for performance – the defining of exactly what is to be accomplished.

If those goals are in place, the performance measurement phase is straightforward. "Does the system match the goals? If not, where is the bottleneck?" he asked.

In any case, he added, "What is the expansion potential?"

Consideration Questions

Actually, Waters noted, the design phase has to take two things into consideration: What really must be done and how should it be done with the greatest economy of resources.

Here again, a series of questions illustrates the concerns the designer must have, he said.

Once the design is set, is it really what the end result should be? Beyond that, what are the future plans? he asked.

In terms of resources, what is the best way to do this? Will our methodology let us grow? And what is the most reliable and supportable method for meeting our goals?

In some plans, there are functions that would be better handled in batch processing; in others, functions laid out for single-thread handling might be done as a paralleled, overlapped task, Waters said.

Designers must determine if all the required functions fit into the time frame that is predicted, plus a pad factor, for good response and throughput.

A full analysis must be done, with inputs from all personnel – programmers, terminal operators, user management and DP management – in order to define the system, Waters emphasized.

Defining the performance goals is another two-step process, the systems engineer continued. The designer has to determine the nature of the required throughput and set goals appropriate to the application.

The goals are best defined in "units of work" terms. Then, by breaking down the units of work into components, a throughput potential or response time prediction can be made, he said.

Result of Design Efforts

Recognizing his presentation was heavily dependent on a lot of questions, Waters pointed out the net result of design efforts in which too few questions are asked might be a "wonderful system that has features no one ever uses" or "an immense amount of overhead for no reason."

Once concern for design has shaped a system that will do the right job, the concern must switch to doing the job right, he went on.

The designer has to make a wise choice of file types so as to minimize I/O accesses and data transmission requirements, he said.

Designers must recognize hardware layout is "critical" to performance, he said. The teleprocessing network must be balanced for even activity distribution, and this means using as many disk channels and devices as possible.

Users should try to keep master files on different disks, rather than on related variable files, to minimize seek times.

When sharing disks, related files should be located near each other, he added.

$295 Sort Handles Small Files

ANAHEIM, Calif. – A low-cost sort package from an independent software vendor here is said to gain its efficiency by being limited in its use to working with only small- and medium-sized sort assignments.

Files larger than 500,000 bytes just aren't handled well by the package, according to Bill Page, DP director for the Page Co.

Sorting is traditionally one of the major operations in a DP installation and Page got into its own development when packages available to it didn't seem to do the work as well as Page wanted, he indicated.

The problem appeared to be that all the packages were so generalized to work with all kinds of files and a variety of sorting demands that they weren't particularly good on any particular type of file, he explained.

At the end of its programming effort, Page had what appeared to be an "extremely efficient" in-core sort for small and medium amounts of data, he said.

At this point, Page claimed he thought he had failed, but he gave copies of the sort to a few users who had helped in the development effort.

Positive Reactions

The reactions were far more positive than he had anticipated, Page said.

Then he realized his own situation wasn't very different from others'. In his installation, as much as 75% of the CPU time utilized by sorting was devoted to precisely the small- and medium-sized jobs for which his coding had been tailored, he said.

"The only solution we could come up with," he added, "was to offer the program at a very low price [$295] and offer a free trial at the user's installation," Page said.

The program itself requires 3K plus whatever room for buffers the user can spare. It works any IBM OS or OS/VS environment, he added.

The company can be reached through P.O. Box 6372, Anaheim, Calif. 92806.

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IUP Extends IBM Life Insurance Program

WHITE PLAINS, N.Y. – The Statutory/Generally Accepted Accounting Procedures (GAAP) Valuation System, an Installed User Program (IUP) from IBM, supports life insurance applications running under IBM's DOS/VS and based on the Consolidated Functions Ordinary (CFO II) program product, a spokesman noted.

Developed by actuaries at Carlin-Black Systems Corp. in Louisville, Ky., the system calculates statutory and GAAP reserves, premium items, details on policy values, reserves released and policy exhibits for year-end and interim reviews, he added.

The valuation portion of the package covers life insurance, annuities, accident and health, supplemental benefits, "extra life" and "paid-up" categories. It accepts the CFO II policy master file directly, IBM said.

The programs extract records from the CFO policy master file, perform various sorts, develop control totals, perform the valuation calculations, print reports and create output files for later programs, the spokesman said.

The logic includes edits, "meaningful" error messages and audit trail reports with control totals, he added.

Written in ANS Cobol, the system was tested with the Cobol/VS compiler and the Sort/VS under DOS/VS Release 32. The programs require three magnetic tape drives, a 3330 disk unit, a printer and a card reader; modifications can be made to eliminate the need for the tape drives or to support other disk systems, IBM said.

The largest program, not including sort, is approximately 90K bytes.

As an IUP, the system will be provided with error-correction services only until Oct. 31. Within that time frame, the support is limited to providing a list of errors and proposed solutions.

The system costs $1,040/mo but payment is waived after the first 12 months of continuous use, IBM said.

Service Aids Investments

TORONTO – A service to help money managers see how a portfolio will perform under various conditions is available from Canavest House Ltd.

The user must provide the raw data based on what he thinks is likely to happen to such variables as interest rates, wage settlements and commodities prices, Canavest said.

Once the user determines the likely return, holdings can be changed appropriately, a spokesman explained.

By-products of the service are hard-copy reports the user can show his clients to explain why certain investments were made.

Users need only English to access the service's two IBM 360/75s by dial-up phone lines.

The service costs $13,000 to $30,000 annually. Canavest can be reached through P.O. Box 13, Commerce Court Postal Station, Toronto, Canada M5L 1A3.

CAC 'Texed' Creates Documentation

CINCINNATI – Texed from Computer Assurance Corp. (CAC) is described as a program that produces "publishable" documentation, letters and standard operating procedures from free-form punched-card input.

In addition to printing whatever text is provided according to user-provided format instructions, the program also provides a table of contents and an alphabetic index with page number references for longer pieces of documentation, the company said.

Input cards are free-form except for three columns on each which are set aside for printer format control. All extraneous spaces are suppressed so that, for example, sentences can be punched on individual cards and sequenced as desired just before the actual print run, CAC said.

Written in ANS Cobol, Texed runs in a 20K partition under IBM's DOS or DOS/VS and requires only a card reader and a line printer as peripherals.

Source code for the program is available for $350. Buyers are also provided a test deck – which produces a user manual – and a hard-copy user manual, a spokesman said from Department C-D, CAC, 8041 Hosbrook Road, Cincinnati, Ohio 45236.

Symposium on Operating Systems Seeks Papers for 1977 Conference

WEST LAFAYETTE, Ind. – The Sixth Symposium on Operating Systems Principles (SOSP-6) will be held a year from now, on Nov. 16-18, 1977, at Purdue University here.

Papers emphasizing concepts or principles of general application in operating systems are invited, according to SOSP-6's paper coordinator, Dorothy E. Denning.

The meeting is sponsored by the Association for Computing Machinery (ACM) Special Interest Group on Operating Systems. It will be hosted by the Computer Sciences Department and arranged by the Division of Conferences and Continuing Education at Purdue.

In the call for papers, Denning said March 31 is the deadline for six copies of each article to be considered. All should be typed (double-spaced) and none should be more than 20 pages long.

The papers will be reviewed "blind" by the program committee, so the author's name and affiliation should appear on the cover page only, she added.

Notices of acceptance or rejection will be sent out by May 15; papers of special merit will be included in a special issue of the *Communications of the ACM* in early 1978.

Papers for the conference should be sent to Denning, SOSP-6 Paper Coordinator, Computer Sciences Department, Purdue University, W. Lafayette, Ind. 47907.

Directory from Atsu Details T/S Services

BOULDER, Colo. – The Association of Time-Sharing Users (Atsu) has published the first three sections of a comprehensive directory for users of commercial time-sharing and remote computing.

Called the "Interactive Computing Directories," they complement the association's bimonthly newsletter, "Interactive Computing," according to Hillel Segal, president of Atsu.

Section Coverage

The first section covers financial modeling languages offered by the time-sharing companies, with data covering 60 languages.

The second section covers interactive data base systems while the third, called "Company Profiles and Security Precautions," offers information about 40 companies offering remote computing services.

The cost of membership in Atsu, including the newsletters and directories, is $60. Atsu is at 75 Manhattan Drive, Boulder, Colo. 80303.

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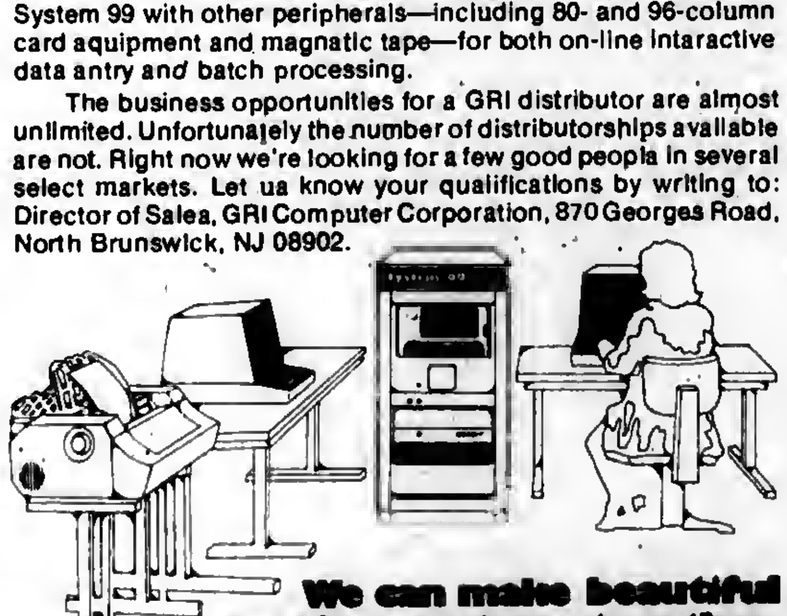

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Survey Finds Users Favor Unrestricted DP for Carriers

By John P. Hebert
Of the CW Staff

RAMSEY, N.J. – Telecommunications users favor minimum regulatory restrictions on the use of computers as an integral part of terminal services provided by common carriers, a recent survey has found.

The Center for Communications Management, Inc. (CCMI), an independent telecommunications research organization here, conducted a survey providing readers of its industry publication, *This Month in Telecommunications,* a chance to voice their opinions on "the role of the DP functions within the data terminals service offerings of the communications common carriers."

Tired of Overregulation

A CCMI spokesman said ballots indicated users are tired of overregulation of the DP and data communications functions in all areas and types of business and believe the dividing line between the functions should be decided by open competition.

Preliminary results of the survey showed 56% of the 200 telecommunications users, consultants, vendors and carriers surveyed selected definitions offered by CCMI which would not restrict the carriers' use of computers at the terminal level, CCMI reported.

The results were summarized and distributed to all Federal Communications Commission (FCC) commissioners, the Office of the President and members of congressional committees active in telecommunications legislation, CCMI said.

Copies of the findings sent to the FCC were entered into the record of the second Computer Inquiry as users' views on current definitions of the boundary between data communications and DP, the CCMI spokesman noted.

Second Inquiry

A second inquiry was initiated, the FCC said, because distributed networks in which CPUs and terminals are performing both DP and communications control applications have been among the developments since the first inquiry in 1971 [CW, Aug. 9].

Readers of the CCMI publication were asked to choose one of six alternative definitions of the role of DP as it applies to carriers' terminal offerings. CCMI ranked the six definitions as restrictive to the common carriers' use of computers, permissive or noncommittal, the spokesman explained.

No attempt was made to categorize a seventh choice, which offered the respondent his own opinion, although some of those responses were sent to the FCC along with the survey's results, he added.

A total of 37% of respondents agreed there should be no restrictions placed upon the carriers' authority to provide integrated DP functions with their data terminal equipment; about 21% said if a user's primary application of a terminal's DP capabilities is limited to word processing of the communications functions, it should not be classified as a DP system.

User Majority

CCMI noted 62% of respondents were users, 10% were consultants, 10% were common carriers and 7% were equipment suppliers.

Respondents were also asked to categorize the size of their firm or organization using gross sales as a yardstick; 45% of the returned questionnaires were from firms with sales over $100 million and 19% were from respondents in organizations with annual sales between $10 million and $100 million.

About 20% of all those who returned the survey favored a permissive stance for common carriers' use of computers at the terminal level, CCMI said.

The responses were "probably the opinions of more outspoken people because it was not easy to get the responses back" to CCMI; the publication's readers had to take the initiative to return the questionnaires, the spokesman said.

CCMI can be reached through P.O. Box 324, Ramsey, N.J. 07446.

Fujitsu Net Architecture Based on HDLC

By Ronald A. Frank
Of the CW Staff

CHICAGO – Fujitsu Ltd. has developed a data communications architecture which is operational on several Japanese data networks utilizing the firm's Facom CPUs, according to Shigeo Shiratori of the Fujitsu data communications architecture staff.

Called the New Network Architecture (NNA), or Realized Network Architecture, the technique includes a data link protocol based on the Higher Level Data Link Control (HDLC) developed by European standards groups, Shiratori told a session on international data networks at the recent Info '76 conference here.

An advanced network architecture had to be developed for Japanese data users because of the high cost of carrier facilities; a voice-grade line costs about $3,000/mo over a 500-mile link for operation at 2,400- or 4,800 bit/sec, Shiratori said.

NNA is based on a separation of on-line system functions into DP and data communications control. It also includes a classification of data communications control functions and the use of HDLC, he explained.

HDLC is more reliable than conventional basic mode link control procedures because it has sequential number and check bytes against error in each transmission block and corresponding response, Shiratori said. Although the Fujitsu architecture is similar to IBM's Systems Network Architecture (SNA), it was developed before SNA and is different in implementation, he added.

In designing the architecture, the separation of DP and data on-line system functions also helped clarify the respective roles of control programs and applications programs. As a result, the role of control programs was redefined and the support level was improved, he said.

Three hierarchical levels were incorporated into the architecture, according to Shiratori. These are data link control, network control and path control levels.

In addition, a protocol was developed for remote job entry and file transfer called the application control level, he noted.

The link level controls a data link between physically connected nodes to prevent errors occurring on communications lines. Various types of nodes exist: center systems, subcenter systems, terminals, etc.

The network level controls a session between a source node and a destination node to transfer data correctly. The path level controls a session between a process in one end node and a process in another to connect and disconnect them. The path level also controls data flow between the nodes, Shiratori explained.

Path-level control may be done when net-level control is in operation and net-level control may be done when link-level control is operating. In each station, three control modules correspond to the control levels, but each level of protocol is independent of the other, enhancing flexibility since one can be changed without affecting the others, Shiratori said.

One network operating with the Fujitsu architecture includes a Facom 230 Model 58 which "has nearly equal perform-

(Continued on Page 21)

'Dicam' Lets Datasystem 350 Communicate With IBM 360/370

MAYNARD, Mass. – Digital Equipment Corp. has introduced software which allows the company's Datasystem 350 series of small business systems to interactively communicate with IBM 360/370 mainframes.

Written in Digital's Business-Oriented Language (Dibol), the Dicam software permits 9,600 bit/sec transmission in IBM's Bisynchronous protocol over dial-up or other phone lines, according to a DEC spokesman.

This allows a decentralized approach to DP operations, he added.

Dicam permits the local storage resources of a Datasystem to complement the data base and processing resources of the host IBM system while remaining an independent processor, he said.

Datasystems operating with Dicam include CRT terminals, printers and mass storage devices ranging from 512K bytes on floppy disks to 112M bytes on removable disk cartridges, he said.

Major application areas for the distributed processing arrangement include sales order entry, inventory control, billing, consumer information and relations, payroll and waybill generation, according to the firm.

The Dicam software, which runs under DEC's CTS-300 operating system, has a licensing fee starting at $4,500; it will be available in January, the spokesman noted from DEC's Commercial Products Group in Maynard, Mass. 01754.

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Upgrades Controller, Adds Scanner

IBM Brings Out 3660 Enhancements

WHITE PLAINS, N.Y. – IBM has upgraded the controller portions of both its 3660 supermarket key-entry and scanning point-of-sale (POS) systems while adding another, smaller scanner to the 3660 scanning system.

IBM's 3663 Model 3 terminal control segments – logic and memory boxes which work in conjunction with the key-entry supermarket terminals – can support three checkout keystations; its Model 2 predecessor had the capability to support only two stations, an IBM spokesman explained.

With the 3663 Model 3, the maximum number of checkout lanes for the system is increased from 12 to 18, which also translates into savings in some medium-sized installations, he said.

For example, supermarkets installing the key-entry system with the upgraded controller segment for nine checkout lanes can purchase a typical system for about $47,600 compared with about $59,500 for the same configuration with a 3663 Model 2. The spokesman said the cost saving results from a greater sharing of computational capabilities.

The Model 3 control segment performs the same functions a key-entry system in-store controller performs if the system controller fails, he added.

Certain in-terminal devices such as key-pad locks are now optional features, although two previously extra-charge optional keyboards are now available as no-charge options, IBM said.

First shipments of the 3663 Model 3 control segment are scheduled for this quarter.

Model 2 Controller

The corporation also brought out the 3661 Model 2 in-store controller for the 3660 key-entry system. The Model 2 features up to 560K characters of information storage, double the storage capacity of the Model 1 controller, IBM said.

The 3661 Model 2 stores data for price lookup, in-store reports and sales for the entire system. It will be available in the third quarter of 1977 and carry a purchase price of $14,620.

Along with the key-entry system introductions, IBM also announced another version of its supermarket POS system scanner.

The IBM 3667 scanner is contained in a 28-in.-high enclosure; the previous Model 3666 scanner is 38 in. high.

With the 3667, a store with 10 checkout lanes can purchase a basic system, including an in-store controller, terminals, scanners and adapters, for about $133,100 compared with the previous cost of $154,100. IBM noted the savings primarily result from the lower cost of the 3667 and from lower cost adapters.

Additionally, IBM reduced the purchase price of its current 3666 scanning unit from $4,240 to $3,560, which is the price of the 3667 scanner, according to the spokesman. The reduction was possible because of cost savings in IBM's engineering and manufacturing of the scanners, he said.

Label Preparation Device

Another feature introduced for the 3660 systems is a shelf-label preparation device enabling supermarkets to print price labels in the store.

With this device, pricing and merchandise information can be developed by a supermarket chain's headquarters and transmitted to an in-store control unit. There, IBM said, labels can be printed two at a time, side by side on a supermarket system POS terminal.

The label preparation feature for both systems is field-installable and will be available in April at a cost of $600 or on IBM's Alternate Term Plan for $23/mo.

Fujitsu Using HDLC As Architecture Base

(Continued from Page 20)

ance to the IBM 370/158," Shiratori said. The Model 58 serves at the center node and communicates with subcenter nodes that have a Facom 230 Model 35 and a Model 28.

Transmission between these centers at 48 kbit/sec utilizes NNA. Data entry and inquiry into the network are done on Facom 9520 CRT terminals and Facom 1520 teleprinters, he said.

The network simultaneously handles message collection, distribution and remote batch applications with the high-speed lines sharing the traffic.

Another distributed network for a manufacturer uses HDLC on all its links and utilizes several minicomputers as intelligent terminals, a node CPU and a process computer, Shiratori said.

HDLC More Effective

A study of network implementations using NNA showed the HDLC-based operation was 1.1 to 1.3 times more effective than basic mode on point-to-point applications, he said.

Full-duplex transmission is common on these types of configurations, so this transmission mode was assumed for the comparison, he pointed out.

In a multipoint evaluation comparing half-duplex basic mode with full-duplex HDLC mode, NNA was 2.1 to 2.3 times more efficient, he said.

Converter Debuts

WORCESTER, Mass. – What is billed as the only 8-bit digital-to-analog converter in a dual in-line package that includes a storage register has been announced by Micro Networks Corp. (MN).

The MN3020 converter can be used directly with microcomputer or minicomputer data buses because of its input registers, according to an MN spokesman.

The unit includes an internal reference and output amplifier as well as the storage register; the input circultry is said to be TTL-compatible.

When the converter-enable input is high, input data is held and the analog output will not change with further changes in the digital input.

The MN3020 is priced at $39. A military version, the MN3020H, costs $69 from MN at 324 Clark St., Worcester, Mass. 01606.

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Qantex Adds Interface Adapter

PLAINVIEW, N.Y. – Qantex has a dual interface adapter, the DIA-100, designed for use with its models 2200, 2400 and 2710 cartridge storage systems.

The DIA-100 permits a storage system to become a two-port device; one of the systems' two ports can be interfaced to similar or different controllers, Qantex said.

Utilization of the DIA-100 is said to allow two or more redundant CPUs to share a common data base by communicating with the Qantex cartridge storage peripheral.

CPUs accommodated by the system include the Digital Equipment Corp. PDP-11, Intel Corp. 8080 and Rolm computers.

The adapter consists of a single printed circuit card that plugs directly into the storage system.

The DIA-100 costs $695 from Qantex at 200 Terminal Drive, Plainview, N.Y. 11803.

CMC 1800 Gets Remote Keystations

MARINA DEL REY, Calif. – The CMC Division of Pertec Computer Corp. has added remote keystation capability for the CMC 1800 Keyprocessing System.

The video display keystation is offered in two models, the CMC 1155 and 1156, each with detachable keyboards, according to a Pertec spokesman.

The 1155 features a keypunch-style keyboard while the 1156 has a typewriter-style keyboard with numeric pad, he said, adding both models utilize standard CMC software.

The remote data entry capability reportedly allows keystation operators at remote sites to enter, verify, correct and update data through dial-up phone lines under the control of a central supervisor.

A built-in remote keystation adapter/modem at the remote site and a remote keystation controller at the central site enable the 1800 system to control the remote keystations, the spokesman said.

Data transmission to and from the keystations is asynchronous and full-duplex on two- or four-wire systems, he noted.

Each remote keying terminal can interface a second keystation terminal – for a total of two – directly to the communications line by means of a Bell-supplied Data Access Arrangement (DAA), he added.

The CRT units for both models can display eight 32-character lines and a 240-character data record plus 16 characters of mode and status information.

The keystations operate at two speeds: at 150 bit/sec to the CPU and at 2,400 bit/sec from the CPU to the keystation to update or change data appearing on the CRT.

A 480-character buffer comes with either model as standard equipment, although only 256 characters are ordinarily used, a spokeswoman added.

Both keystations cost $8,400 each or $4,900 each in groups of eight; they lease for $210/mo or $122.50/mo respectively, she added.

The CMC Division of Pertec is located at 2500 Walnut Ave., Marina del Rey, Calif. 90291.

Trivex Launches Fault Isolation For Plus 70 CRT

ORANGE, Calif. – Fault isolation routines which reportedly spot the cause of display system failures have been added to Trivex, Inc. Plus 70 IBM 3270-compatible systems at no additional cost.

With the isolation routines, according to Trivex, the terminal controller lets the user determine whether the terminal system, communications controller, modem or phone line is the cause of malfunction.

The user can trace the source of the problem to the host computer, at the far end, or down to the board level of the terminal, a spokesman added.

Microprocessors that drive the Plus 70 are used for the diagnostic routines; pressing a test button on the device activates the isolation program, Trivex said.

The terminal controller's diagnostic program also monitors the quality of the communications portion of the system and stores the information in terms of nonacknowledgements (NAK) sent and received from the time the system was last powered, it added.

Information in the controller can be released in status report form to any of the Plus 70's display and print stations or transmitted to the user's central site, the company said from 2201 N. Glassell St., Orange, Calif. 92665.

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With Users, Within Data Center

Doctrine of Separation Suggested for DP Departments

By Nancy French
Of the CW Staff

CHICAGO – Good organizational controls are important in all areas of a business, but they are particularly important in DP because they ensure the quality of the DP product as well as the financial stability of the company, according to William Murray, a senior marketing support administrator for IBM's Data Security Support Program.

Since application development controls all other operations in the DP department, DP should be formally separated from the using departments, Murray told a recent Info '76 session here.

All requests for development of new programs or changes to old ones should be authorized, tested and accepted by using departments, he said.

User departments should be accountable for ensuring the work done by the DP department is consistent with their authorization and their expectations. Source documents should be created and maintained by user departments, he added.

Separation of Duties

Not only should the DP function be separated from users, duties within DP must also be maintained separately, Murray suggested.

A person who has responsibility for job initiation should not have responsibility for data input or data output, nor should a person whose job it is to add vendors' names to a file be responsible for authorizing payments.

At best, that employee could make costly errors that go undiscovered. At worst, he could even convert certain applications to his own uses, Murray said.

It was recently discovered that a New York City programmer made a five-line change in a program which contained a one-line error. That error caused $21 million in welfare checks to be sent to dead people, Murray said.

It didn't make city officials feel much better to learn all bnt $7 million of those checks were recovered, he added.

In converting to new systems, DPers often recombine duties and forget why the original responsibility separations were made, he pointed out. For example, several years ago IBM replaced a batch accounts receivable system with an on-line real-time accounts receivable system.

In the batch system, the accounts receivable master record has its own customer name and address fields; people who were authorized to process accounts receivable transactions could not change those customer name and address fields.

In the real-time system, the accounts receivable record had no name and address field but merely pointed to the customer master record.

In one branch office, an accounts receivable specialist was authorized to process the return of typewriters for credit and the clearing of those credits by issuing a check. As part of an unrelated duty, he was authorized to make changes in the customer master record.

One day the employee processed the return of a typewriter for an attorney. That afternoon he opened a post office box in the attorney's name and pointed the customer master record for the attorney to the post office box he had just opened; he then caused the credit to be cleared by the issuance of a check.

After removing the check from the post office box, he changed the name and address field of the customer master record back to the attorney's place of business.

In order to cash the check, he opened a bank account in the attorney's name using the check as both identification and as an initial deposit, Murray said.

He was detected when the statement that went to the attorney showed his credit had been cleared by a check. Since the attorney had received no check, he called to inquire, and the manager was alerted.

The individual was dismissed, but not prosecuted. However, the manager, too, was dismissed for poor management, Murray said.

Honesty Not Enough

Too many employers – especially the Defense Department and banks – believe all they need do is hire honest people. Instead, they should take the responsibility for keeping their employees honest by giving them thorough supervision, Murray said.

If an employee is terminated, he should be terminated at once. One insurance company that terminated a tape librarian with two weeks' notice nearly went under because in those two weeks the individual was able to destroy the entire system of backup tapes, he said.

Operational controls provide for integrity of data and should be used to help detect and correct errors as well as ensure all data is processed, he said.

Key verification, in which source data is key entered twice, is one method, and in on-line systems conversational feedback is another.

Amdahl 470V/6 'Very Close' To Meeting Objectives: Input

By Esther Surden
Of the CW Staff

MENLO PARK, Calif. – Although Amdahl Corp.'s original objective of obtaining two times the performance of the IBM 370/168 has not been achieved, on a price/performance basis the Amdahl 470V/6 is "very close to meeting its objective" of providing twice the power for the user's money, according to a report by Input, a market research organization here.

"Generally on a price/performance basis, Amdahl does even better than the results presented on a straight performance basis," according to the report, "Assessment of Amdahl as a Viable Alternative to IBM."

"One customer cited a 1.51 performance figure on benchmarks, but quoted a 1.9 to 1 advantage over the 168 on price/performance," Input noted.

The report was based on interviews with 10 companies which are Amdahl equipment users and nine that considered the Amdahl system but rejected it. An independent benchmark run by a consultant affiliated with Input was also used as a basis of comparison.

Performance and Price Increase

The IBM 168-3 provided a 5% to 13% performance improvement over the 168-1, but also contained an increase in price which kept price/performance relatively stable, the report said.

"The attached processor system has a theoretical performance approaching Amdahl, but the increase in price still leaves the price/performance advantage with Amdahl," it added.

Five users who currently have Amdahl 470s reported the results of eight benchmarks which showed performance of the system in the range of 1.1 to 2.3 times the 370/168.

Seven of the users who rejected the systems reported 1.3 to 2.0 times the performance of the 168 in their benchmarks, the report indicated. The consultant's benchmark also backed up the results of the user benchmarks, the report stated.

The overall results "are somewhat on the high side compared with those reported in our interviews, but that is probably due to the nature of applications selected which used a substantial amount of decimal arithmetic," Input noted.

On an instruction-by-instruction basis, 18 instructions are slower on the Amdahl than on the 168. "The most significant one is Execute where the 168 is more than two times as fast as the Amdahl," the report said.

Amdahl, however, has released an engineering change which increases the performance of this instruction, it noted.

"However, most Amdahl instructions are between 1.5 and 2.5 times faster than the 168," the report concluded.

The full report costs $2,500 from Input at Suite 320, 2180 Sand Hill Road, Menlo Park, Calif. 94025.

Univac Disk Storage Subsystem Added for 1100 Systems, 90/80

NEW YORK – In conjunction with its recent announcement here of the 1100/80 large-scale system [CW, Nov. 15], Univac introduced the 8434 disk storage subsystem, which can be used with both the 1100 systems and the 90/80.

The 8434 increases the on-line storage for the 90/80 to 4.9 billion bytes and for the 1100 systems to 1.7 billion words in fixed record formats, Univac said.

The subsystem for the 1100 series includes a 5046 controller and two to 16 disk drives. For the 90/80 system, the subsystem includes a 5040 control unit and two to eight drives.

The controllers can accommodate either 8434, 8430 or 8433 drives in any combination as well as an 8405 fixed-head disk as an option, the firm said.

Each 8434 drive includes a fixed disk stack of 10 platters with 19 recording surfaces; the last surface is used for servo positioning information. Each drive can store up to 307M bytes in software-supported formats, the company noted.

A voice coil electromagnetic actuator positions the read/write heads in about 30msec; throughput is said to be 1.25M byte/sec.

The word-oriented disk control unit offers diagnostic capability via a microprogram loaded from a diskette. The byte-oriented 5040 is also microprogrammable, Univac said.

The 8434 disk subsystem in a minimum configuration with two disk drives costs $4,876/mo on a one-year rental plan or $168,600 to purchase. It will be available in April.

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Multi-CPU Sites Get CPI Monitor

WATERLOO, Ont. – The DSP-190 is a minicomputer-controlled hardware monitor designed for large-scale system users or the multiple CPU shop, according to its vendor, Computer Performance Instrumentation, Inc. (CPI).

Available in three models, the monitor can concurrently produce a 128-function system profile, two working set maps at 3M sample/sec, eight additional maps at .1 MHz and tracing of system accesses to up to 700 IBM 3330-type disk drives, the firm claimed.

The unit can also control five remotely located monitors and process management reports, a spokesman added.

The three models are determined by the components involved, he noted. A Model 1 has 192 sensors, eight concentrators, four collectors, a Digital Equipment Corp. PDP-11/34 minicomputer with 64K of memory, two floppy disks, 80M bytes of 3330-type disk, a 1,600 bit/in. tape unit, graphic CRT input console with eight-color display, front-end processors and a 180 char./sec printer. It runs under DEC's RSX11-M operating system.

The Model 2 has eight collectors and the Model 3 has 384 sensors, 16 concentrators, 96K of memory, an attached measurement processor and uses a PDP-11/04 as well as the 11/34.

Hybrid Mode

In addition to performing as a conventional monitor with self-contained collection, reduction and reporting resources, the DSP-190 can operate in full Hybrid mode, CPI noted. It may be fully programmed for a particular measurement from a process originating in the host CPUs, the spokesman explained.

Software support includes a standard package of 40 management-oriented reports and a measurement syntax language which allows users to create their own applications and reports.

The Model 1 costs $164,175, the Model 2 is priced at $180,175 and the Model 3 costs $229,870. First deliveries will be in January, CPI said from 572 Weber St. N., Waterloo, Ont., Canada N2L 5C6.

Stand-Alone Printer Available From LRC

RIVERTON, Wyo. – A 40-column stand-alone printer system is available from LRC, Inc.

The Model 140 uses a dot matrix impact printing method and is controlled by a proprietary MOS interface chip which includes a 48-character buffer, a character generator and control logic, LRC said.

Character width and density can be changed at any time – even during printing – through external commands, according to the firm.

Options include RS-232C or current loop communications interfaces, pin-feed platen, high-speed paper feed, label printing and front-feed document printing.

The unit costs $495 from the firm at Technical Research Park, Riverton, Wyo. 82501.

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Dual Processors Hold Surprises

By Don Leavitt
Of the CW Staff

SAN DIEGO – The Bonneville (Ore.) Power Authority studied the changes in its DP environment as a result of shifting to a multiprocessor system and the results held some surprises, according to an analyst for Control Data Corp. who worked on the project.

The upgrade took place in September 1974 and involved moving from a CDC 6400 to a 6500, which is the same system with a second 6400 CPU, Michael A. Gray told the Computer Performance Evaluation Users Group (CPEUG) here recently.

The addition of two more disk units in late October 1974 "had a considerably smaller impact" than the second CPU did and, since the work load remained approximately equal, the performance changes were quite directly attributable to the second CPU.

Within a year of the change, data collected by the system log and by a software monitor written in-house showed a 25% increase in batch throughput.

Other statistics showed the system was I/O-bound for batch work and, as previous studies had indicated, this was enough to limit the throughput increase, he explained.

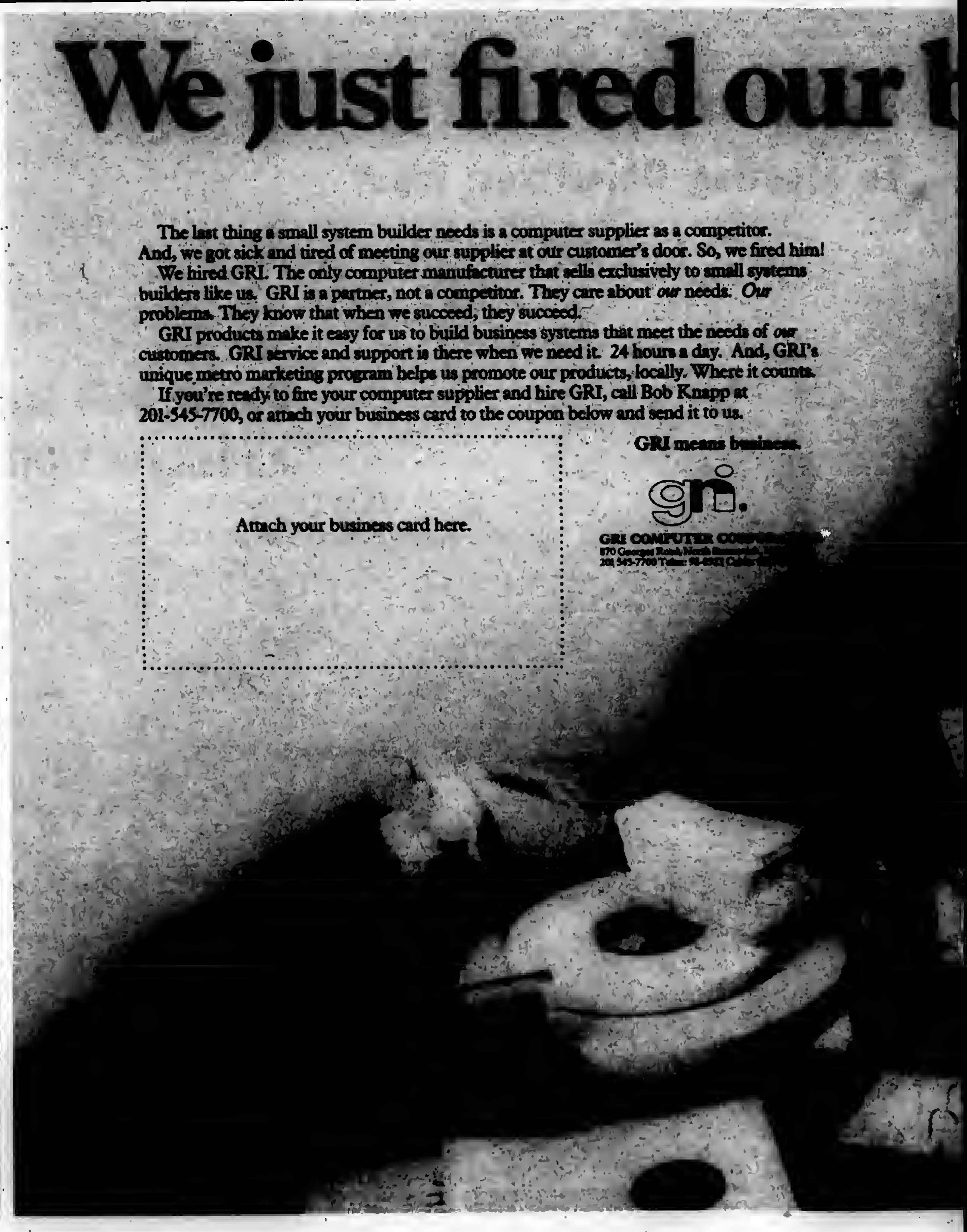
A "considerable increase" in log-ons and time-sharing CPU hours showed the second CPU had a major impact in this area. The logic of the Scope 3.3 operating system allowed a split of the batch and time-sharing jobs and the second CPU enabled each stream to use one CPU.

Throughput for time-sharing, therefore, increased sharply, he said.

An "interesting effect" of the high utilization of one CPU being split between the two CPUs was that there was only a slight increase in CPU hours divided by wall clock hours with the addition of the second CPU, Gray continued. In effect, the single CPU "appears to have degenerated" into two lower utilization CPUs.

The percentage of one CPU's work for batch had decreased while the time-sharing percentage nearly doubled, he said, noting the slack in the batch utilization was taken up "almost completely" by the second CPU.

Main storage is "very highly" utilized, but decreasing the main storage use – which "could lead to considerable improvement" – depends strongly on peripheral processing unit (PPU) activity, Gray said.



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Baking Firm Whips Up Savings With Data Entry System

By Alan W. Hawkins

Special to Computerworld

COLLEGEDALE, Tenn. – The conversion from IBM keystations to a Univac 1900 Computer-Assisted Data Entry (Cade) system at the McKee Baking Co. here has increased keystrokes by about 2,000 per hour while allowing the firm to catch about 75% of the key errors through verification.

McKee is a privately owned snack cake baker which makes Little Debbie Snak Cakes, distributed to over 42 states.

The decision to upgrade from the two IBM 3742 keystations and the one 3741 with a 3747 tape converter used to convert the data to tape for input into the company's Univac 9480 mainframe was reached for a variety of reasons.

The IBM systems offered limited editing capabilities and the DP department wanted to do value ranges and table lookups.

Also, data had to be input into the system in a very structured way and the firm wanted the operators to be able to enter the data as it appeared on the input document.

Reluctant to Relinquish

The key operators were very reluctant to give up the 3740s because they were fast and easy to use. However, the firm needed to be able to provide additional editing at data entry time.

At first, McKee decided to try a distributed network system from Datapoint Corp. The system didn't work because the firm's software did not provide the response time required for the batch data entry applications run at the baking company.

The company felt it didn't need the extra added capabilities of the distributed system and, after two months, the system was scuttled.

McKee then considered systems from Entrex and Keydata as well as the Univac Cade system, but found that neither the Entrex nor the Keydata system could keep up with the speed required by the firm.

The next step was to order and install a Univac 1900 Cade system with six keystations. At installation the systems cost $13,065/mo. A subsequent upgrade of 8K of memory, bringing the system to 57K bytes, and the addition of eight keystations has increased the monthly cost to $21,091.

The company is pleased with the way the conversion turned out. It took about two weeks to write the programs (approximately 10) for all the applications already running on the 3740s, plus a few additional ones.

Now, about 55 programs are on the Cade system.

The largest application is the billing, during which 7,000 document/day are processed.

Check reconciliation, a garage repair system for the firm's trucks, a trip record system for the salespeople, accounts payable and several master update applications are also run on the system.

The average keystroke rate is now about 18,000- to 20,000 keystroke/hour and two operators key over 24,000 keystroke/hour with less than .05% verifiable error rate.

The edits in the system down the line indicate that the system is catching about 75% of key errors through verification.

The average keystroke rate on the IBM systems was between 16,000- and 18,000 keystroke/hour.

Happy With Operation

The key operators are happy with the way the terminal operates.

Increases in volume have less impact on workload because of the faster keying rates and the cleaner data that goes to the computer room. Some applications required three or four punched cards per transaction and the firm can now key these items in one pass.

In most applications, there is less data to key because keying of duplicate fields has been eliminated.

Another advantage is that the company can key data as it appears on the source document and reformat it internally for output.

Hawkins is DP manager at McKee Baking Co.

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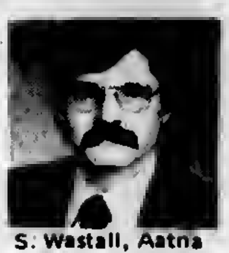
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Bits & Pieces

Fabri-Tek Add-On Memory Designed for DEC PDP-11

MINNEAPOLIS – The Add-In 11 from Fabri-Tek, Inc. is an OEM semiconductor add-on memory system for the Digital Equipment Corp. PDP-11 series.

The Add-In 11, which uses dynamic MOS technology, is plug-compatible with the PDP-11/04, 11/05, 11/34, 11/35, 11/40, 11/45, 11/50 and 11/55, the company noted.

The system is offered in a 16K by 18-bit or 16K by 16-bit configuration contained on a printed circuit board that plugs into the PDP-11.

Memory capacity can be increased in 16K increments up to 128K words and memory operation can be interleaved on 4K boundaries, the firm said.

The 16K by 18-bit version with on-board regulator for the 11/05 through 11/55 costs $1,250; the 16K by 16-bit version for the 11/04 to the 11/34 costs $1,185, the firm added.

Fabri-Tek is at 5901 County Road 18, Minneapolis, Minn. 55436.

Med-E-Comp Adds Mini for Doctors

HURST, Texas – A turnkey minicomputer for use in doctors' offices and based on an Interdata, Inc. 6/16 CPU has been introduced by Med-E-Comp Corp.

Physicians can display their own forms on the CRTs, the firm said.

Medical records, billing, accounts payable, taxes, payroll and insurance packages are available for the system.

A basic system includes a 6/16 CPU with 65K of core memory; 5M bytes of disk expandable to 200M bytes; a CRT; matrix printer; and a backup cassette tape storage system, the firm said.

The system costs under $16,000, it added.

Med-E-Comp Corp. is at Dept. C-6, 632 Bedford Euless Road, Hurst, Texas 76053.

Tion Announces Burster

OAKLAND, Calif. – A burster designed for use with small-business systems is available from Tion Co.

The 260B has a tear bar that measures forms length, aids forms feeding and is "virtually jam proof," the firm claimed.

The bar is combined with a transparent safety cover which can only be raised by lifting the paper width guides and closed by pulling the safety release knob, the firm said.

Operating at either 82 ft/min or 125 ft/min, the unit can handle single-part continuous forms.

Tion is at 262 Grand Ave., Oakland, Calif. 94610.

Family of Three Machines

Varian V77 Aimed at Multi-CPU Nets

By Esther Surden
Of the CW Staff

IRVINE, Calif. – A family of minicomputers ranging in size from an OEM CPU on a board to an end-user supermini has been introduced by Varian Data Machines here.

The three upwardly compatible microprogrammed CPUs announced recently were designed to allow users to structure "multiprocessor networks of tightly coupled computers," the firm said.

They are suited for use in aerospace, financial, governmental, scientific or university environments, a spokesman added.

The family was developed to give the user three ways to build multiprocessor systems – through shared memory, through intercomputer I/O bus connections and through serial communications channels, the spokesman noted.

Called the V77-200, V77-400 and V77-600, the CPUs are software-compatible with current Varian minicomputers, he added.

Common features throughout the V77 family include use of a dual data bus, microprogramming, 32-bit arithmetic capability, a 187-instruction set and byte, word and double-word addressing.

Hardware multiply/divide, 64-vectored interrupts, direct memory access (DMA), a real-time clock, automatic program loading and the capacity to accommodate CRT or teletypewriter controllers are additional common features, the spokesman said.

For communications and networking applications, a data communications multiplexer and its associated line adapters provide a universal communications hardware interface for the V77 family, the company noted.

Megamap Option

The 600, the top-of-the-line V77 model, is on the level of a Data General Corp. (DG) Eclipse or a Digital Equipment Corp. PDP-11/70, the firm claimed. It features a 370 nsec, 1K-word cache memory with a 90% hit rate, the spokesman said.

Using the Varian Megamap memory mapping option, the 600 can accommodate up to 1M words of 660 nsec MOS main memory, Varian said.

Up to 4K words of writable control store (WCS) can be accommodated by the 600, he added, noting the microinstruction is 64 bits wide.

A floating-point processor which performs single- and double-precision as well as floating-point arithmetic is available for the 600. Floating-point processor transfers are made through DMA, the firm noted.

The 600 also has all of the characteristics of the smaller 400, which is said to perform at the level of the DG Nova 3/12 or the more powerful range of DEC PDP-11/34s, the spokesman said.

The 400 features power fail-restart, memory protect, and dual-port memory capacity for shared-memory applications. It can accommodate up to 256K words of main memory without memory mapping and up to 1M words with the Megamap option. Byte parity is available for main memory, according to the spokesman.

The WCS feature on the 400 allows users to generate their own microinstructions with a standard microprogram software package. The WCS for the 400 has storage locations for a maximum of 3K 32-bit microinstructions, he noted.

The dual-port shared memory introduced allows the CPU to directly access memories of other V77 systems.

High-speed peripherals can be linked directly to the memory bus, which transfers data at 1M word/min, he added.

CPU on a Board

The V77-200 CPU on a board is said to offer performance in the range of a DG Nova 3/4 or a DEC 11/34 on the low end of the line.

The 200 can accommodate a maximum of 32K 16-bit words of 660 nsec MOS memory. Memory is expandable in 8K, 16K or 32K increments packaged in a chassis with a power supply and I/O controllers, the firm said.

Users of the 200 can upgrade to the 400 by substituting processors, Varian said.

The systems run under the Varian Omnitask Real-Time Executive (Vortex) and Vortex II mulitprogramming operating systems. Communications take place via the Vortex Telecommunications Access Method.

The V77-200 costs $1,200 for the processor board only or $7,600 for a chassis-mounted CPU with 32K of memory and V77 family standard features. The 400 costs $10,100 with 32K words of memory.

The 600 with 64K, 16-bit words of memory costs $22,450.

All systems will be available in the first quarter. Varian is at 2722 Michelson Drive, Irvine, Calif. 92713.

Reality II From Microdata Designed for Small Businesses

CHICAGO – Microdata Corp. introduced a small business system at the low end of its Reality product line and a line printer at Info '76 here recently.

The Reality II is a limited-expansion system aimed at businesses smaller than those which have traditionally used Reality products, the company said. The basic configuration includes the 1600 CPU, 16K bytes of main core memory, 5M bytes of virtual disk memory, 5M bytes of file store memory, a Prism display terminal and a Scribe 120 char./sec matrix printer.

The system is expandable to a maximum of 32K bytes of core memory and can accommodate two additional terminals, according to a Microdata spokesman. A user can also select remote slave matrix printers for use with a Prism on any of three I/O ports, he added.

Priced at $31,000, the Reality II will allow users to upgrade through the entire reality line, the vendor said.

The Scribe line printer is manufactured by Applied Computing Technology, acquired by Microdata last week as a wholly-owned subsidiary.

The printer, which has optional interactive graphics capabilities, utilizes a 4-bit microcomputer controller for its 9 by 7 dot matrix and prints an Ascii 96-character line. It has a 320-character internal buffer for storing over two full lines of data, the spokesman noted.

Optional features include 165 char./sec speed, horizontal and vertical addressable head positions, half- or full-duplex operation and a keyboard for the operation of a byte-parallel system console.

Additional interactive graphics options include a parallel or serial RS-232 I/O interface, a keyboard for terminal operation, full incremental plotting and foreign language capabilities, the firm said.

The 120 char./sec printer priced at $2,910, is also available in OEM quantities for $1,950 each.

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Computerworld is seeking manuscripts for a special report on dedicated systems to appear in the issue of Jan. 31. Deadline for the material is Dec. 20.

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It All Started With T/S

Growth Forces Small Firm to Switch to Larger Mini

MINEOLA, N.Y. – Expansion caused by unprecedented growth is a problem facing many small firms as they develop. For Van Wyck International Corp. here, expansion meant taking out the limited-capacity small business system it had been using since 1972 and putting in a larger minicomputer.

"Our strength has been service," according to Irwin Septimus, executive vice-president for the supplier of electrical kitchen appliances.

"To give service, you need information – the right information – quickly," he said, adding the small system was getting bogged down and not providing the necessary information.

The firm's DP history goes back about eight years, when it decided to do something about its ballooning paperwork problem. Time-sharing seemed to be the solution, but even a switch from one time-sharing company to another didn't provide the information Van Wyck needed.

Finally, the firm made the leap to an in-house system in 1972.

First Expansion

A Basic Four Corp. Model 400 system was installed in Mineola to handle order processing, billing, inventory control, accounts receivable and sales analysis. This workload began to grow very quickly, and the system expanded from 4.2M bytes of disk storage and two CRTs to 12.6M bytes of storage and four CRTs.

But even this large increase was insufficient, Septimus said. During peak season, open order files had to be maintained on three separate removable disk packs. A monthly sort of sales performance required about 60 hours.

As sales continued to rise – from $14 million in fiscal 1975 to $24 million in the most recent period – the volume of paper increased and information too frequently was lagging.

"Two areas in particular had to be upgraded," according to Donn Liles, president of Data Basics Corp., Van Wyck's consultant and software supplier.

"First, management was always frustrated by inadequate information on the status of open orders, obviously a critical factor when you depend heavily on customer service as a prime weapon in your battle against competition. Second, the system was very slow in sorting; it was difficult to get meaningful after-the-fact data on sales, shipments, etc. in sufficient time to react."

Second System

So the decision was made to move on to another in-house system based on the recommendation of its accounting firm and; in January of this year, work began to convert to the Micos minicomputer with Data Basics providing programming. The Micos system, from Mini-Computer Systems, Inc., offered more total capacity, Liles explained.

The system, installed in April, includes a CPU with 64K bytes of core, two 80M-byte disk drives, four CRTs and a 600 line/min printer.

Though costs, including those for applications software, are about the same as for the Basic Four system, the Micos system offers about 12 times the on-line disk storage, three times the print speed and, for certain applications, faster internal processing speeds, he said.

A number of new reports and processes were instituted immediately, including shipments by state, sales by salesperson and customer and open order inquiry.

In the near future, other items will be added, including a magnetic tape interface with Van Wyck's factoring concern; payroll; in-process inventory and bill of material control; raw material inventory control; material requirements planning; purchasing; accounts payable and magnetic tape interface for automatic microfilming of transactions and reports.

One of the virtues of Micos, Liles said, is that it can be expanded at low cost.

Meanwhile, Van Wyck is pleased with the advances already made. The monthly sales analysis that used to take 60 hours is now available in 20 minutes, Septimus noted.

Nova/Eclipse Subsystem Allows Mix of Cartridge, Floppy Disks

SOUTHBORO, Mass. – Data General Corp. (DG) has introduced a cartridge disk subsystem which it said allows mixed cartridge disk and floppy disk configurations and can be dual-ported for shared configurations.

The subsystem was designed for use with the firm's Nova and Eclipse minicomputers.

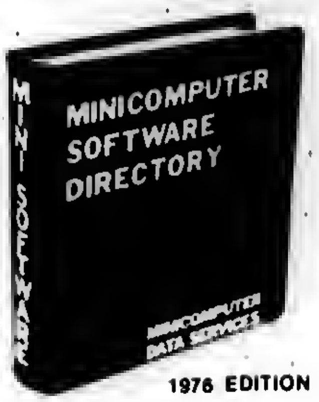
The subsystem can contain 10M-, 20M-, 30M- or 40M bytes of storage. Up to four disks or floppies can be mixed on a controller. A switch allows users to manually select drives, the firm added.

The dual-porting feature is said to allow the configuration of dual-processor shared disk systems using standard equipment and software. It is optionally available and can be added at the user's site, DG said.

The system is supported by all DG real-time operating systems, a spokesman added.

A single-drive subsystem including a cartridge disk drive, integrated power supply, controller and cabling costs $9,950. A 20M-byte subsystem costs $17,950, the firm said.

The subsystems are available immediately from DG in Southboro, Mass. 01772.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CI Notes

Milgo Shuns Adds Merger

MIAMI – Milgo Electronic Corp. has rejected a merger proposal from Applied Digital Data Systems, Inc. (Adds).

Milgo's board of directors, which voted unanimously to reject the proposal, told Milgo "the merger proposal is not in the best interest of the shareholders and did not reflect the long-term prospects" of Milgo, according to a Milgo spokesman.

Under the merger proposal, Adds contemplated taking over Milgo, offering 1.5 shares of its common stock for each share of Milgo. The transaction would have been valued at around $50 million.

William J. Catacosinos, Adds president, said the transaction was proposed as a merger designed to be a tax-free reorganization.

Adds had sales of $17.8 million in its last fiscal year and reported a 53% increase in earnings and a 40% rise in sales for the nine months ended Aug. 31. Milgo reported sales of $40.4 million in 1975, but earnings dropped 56% and sales 3.4% in the nine months ended June 30.

Memorex, Quantor Pact Set

SANTA CLARA, Calif. – Memorex has entered into an agreement with Quantor Corp. for the sale of Memorex 1603 computer output microfilm (COM) printers and 1620 film duplicators to Quantor.

The equipment will be marketed under Quantor's name as part of its total COM system product line; Memorex will provide maintenance for units installed in the U.S.

Quantor chose the Memorex products because they plug directly into IBM 360/370 systems, according to Charles Askanas, Quantor president.

Supershorts

GTE Sylvania, Inc. is providing digital technology training to 150 civilian engineers and technicians employed by the U.S. Navy.

– – –

Data General Corp. delivered its 1,000th Eclipse computer to Societe Generale at the bank's London office.

– – –

Computer Automation, Inc. has appointed Dycor Data Systems Ltd. as exclusive distributor for the Syfa system in Canada.

During 1971-75 Period

Study Shows Four Makers Grew 38%

By Molly Upton
Of the CW Staff

NEW YORK – Four mainframers experienced a 38% average rate of growth in the installed base of their large configurations during 1971-1975, according to a report from L.F. Rothschild & Co., an investment and brokerage house here.

The large configuration market, made up of those systems valued at $2.9 million to $3.5 million, comprised about 23% of the total 1975 installed base of four vendors: IBM, Burroughs, Univac and Honeywell Information Systems (HIS), the report indicated.

IBM and Univac each attained 41% of their growth in this area during the five years, followed by HIS with 29% and Burroughs with 22%, according to Rothschild.

Using data supplied by International Data Corp., Rothschild divided the systems market into seven classifications of systems sizes and among the four mainframers.

Spread Only 9%

There was only a 9% spread among the four in the size of their bases devoted to large configurations, the report showed. IBM, the leader, had 25% of its base in large configurations while Burroughs, which held the smallest portion, had 16% at the end of 1975.

The division of market share in this area remained relatively static between 1971 and 1975, with IBM going from 79.8% to 78.4% while Burroughs started at 3.4% and edged to 3.9%.

Univac managed to grow from 7.5% to 8.7% while HIS dipped from 9.3% to 9%, according to the report.

In the very large configuration sector, which experienced the next highest growth rate of 22% during the five years, IBM and Univac pretty well carved up the market between them.

For systems valued at $4.6 million to $9.6 million, IBM held 71.5% of the market in 1975, up from 65.4% in 1971, while Univac slipped to 25.6% from 34.3%. Very large configurations represented 11% of the four makers' installed base at the end of 1975.

The only area with a negative growth rate during the five-year period was the medium-small category, composed of systems costing $130,000 to $370,000.

As a percentage of total growth during

(Continued on Page 31)

CLASS	1	2	3	4	5	6	7
IBM	2% / 1%	23% / 10%	(6%) / 9%	(1%) / 28%	18% / 17%	41% / 25%	23% / 10%
Burroughs		12% / 5%	1% / 18%	33% / 38%	26% / 21%	22% / 16%	6% / 2%
Univac*		(7%) / 7%	(2%) / 9%	23% / 15%	(5%) / 10%	41% / 23%	50% / 30%
HIS		12% / 6%	(8%) / 20%	18% / 32%	45% / 19%	29% / 20%	4% / 1%
TOTAL	2% / 1%	18% / 9%	(5%) / 11%	5% / 28%	20% / 17%	38% / 23%	22% / 11%

L. F. Rothschild & Co.

Key: A / B

For each vendor:
A = Class as a % of total growth 1971-1975.
B = Class as a % of installed base 1975 year-end.

* - 5% of Univac Installed Base = Misc. Categories.

Chart pinpoints four mainframers' rates of growth in seven configuration sizes. It also shows what percentage of a vendor's base is in each category.

Vendors Not Quite Harmonizing On Common Definition of DDP

By Toni Wiseman
Of the CW Staff

CHICAGO – The definitions of distributed data processing (DDP) at the recent Info '76 here were as numerous and varied as the vendors.

While all agreed DDP depends on a communicating network of hardware, the consensus stopped there, with each vendor varying the scenario slightly dependent on his products' special capabilities.

John R. Bonne, director of data systems marketing at General Automation, Inc. (GA), said DDP "is merely the distribution of an intelligent processing capability to different geographic or functional locales, with each of these distribution points being large or small in terms of processing power and each with a potential for growth or expansion as the application demands."

A DDP network as he envisions it can be comprised either solely of minicomputers or of minis communicating with a host computer. GA, he noted, sells systems for both configurations.

The company is primarily selling sys-

(Continued on Page 32)

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Consumer's Market

BEDFORD, Mass. – The tape market "is a real Ralph Nader market; the consumer is getting more for his money," according to Sig Tolman, planning manager at BASF Systems.

The margins in the tape business have been diminishing, John Healion, director of marketing, said in explaining the projected price hike by BASF at the end of this year [CW, Oct. 25].

The prices of raw materials for items such as polyester film have increased as much as 20%, he said, and further price hikes are expected.

The tape market has become increasingly price-competitive, giving no relief from the pressure applied by price hikes in raw materials, he remarked.

The overseas market reflects the same competitive situation, he added.

Energy Crunch

Tape prices were lowest at the end of 1973, Healion said, and then the energy crunch and its concomitant raw material price hikes raised them somewhat at the end of 1974.

Although current prices are now as low as in 1973, "they're not far from it," he said, although raw material prices are higher.

Healion estimated the tape market is growing about 5% to 6% per year and also shifting to smaller systems.

The firm's flexible disk line is doing well, he said. BASF supplies primarily IBM-compatible diskettes but will make them to an OEM's specifications, he said.

Four Makers' Bases Average 38% Growth

(Continued from Page 30)

the five years, this category declined 5% and comprised only 11% of the installed base at the end of 1975, according to Rothschild.

Medium Market

The medium configurations – those with price tags ranging from $480,000 to $960,000 – had an average growth of 5% for the four makers during 1971-1975; IBM experienced a 1% decline in this category when viewed as part of its overall growth pattern.

But while IBM declined, Burroughs experienced 33% of its growth in this sector and had 38% of its installed base in the medium sector.

IBM's market share declined from 80.9% in 1971 to 75.3% in 1975, while each of the other three mainframers increased their shares in the medium configuration category. At the end of 1975, HIS had 12.6%, Univac 4% and Burroughs 8.1%, Rothschild indicated.

HIS experienced 45% of its growth in the medium-large sector, comprised of machines costing $1.2 million to $1.8 million, the report said. HIS had 19% of its total installed base in this area in the end of 1975, Rothschild said.

In terms of market share, IBM dropped from 80.1% to 74% and Univac declined from 9.9% to 6.7%. HIS grew from 4.1% to 12% while Burroughs rose from 5.8% to 7.3%, the report showed.

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BASF Sees Trend to 'Winchester' Disks

By Molly Upton
Of the CW Staff

BEDFORD, Mass. – The OEM market for Winchester-type units looks "very, very good and is growing rapidly," according to John Healion, director of marketing at BASF Systems.

Helping to compensate for the trend among users of large IBM systems toward fixed disks is the increased demand by users of minis and midis for removable disks, such as 11-high platters, Healion said.

Predictions Erred

As a result, BASF's predictions that sales of its 11-high packs would decline rapidly as of the end of 1975 didn't materialize. Minis and Midis from such firms as Hewlett-Packard Co. and Digital Equipment Corp. are incorporating versions of 11-high drives, he said.

Rather than falling dramatically, the 11-high market is somewhat flat, he added.

In response to the higher than projected demand, BASF started refurbishing and selling packs that came in off lease, according to Sig Tolman, planning manager.

Another reason for the 11-high's popularity, he added, is that the East European market peaks at different times than the U.S. and thus offers additional market opportunities.

Sales Force Expansion

BASF is planning to expand its sales force in order to handle the increasing number of prospects represented by the smaller systems market such as the IBM 3/12, 3/15 and smaller 370s, Healion said.

In addition, the firm is seeking to place more technical expertise in the field to keep up with the increasing complexity of products, such as Winchester-type devices.

BASF, the first independent to ship a Winchester-type module, is supplying these to various OEMs, he said.

Gearing Up Took Time

Gearing up to making a Winchester-type unit took some time, Healion recalled. Previously, magnetic particles on a disk were arranged randomly, but in a Winchester-type unit the particles are aligned in the direction in which the recording is done. Also, the coating is extremely thin.

But production is flowing very well, he said, adding he expects the techniques learned from making Winchester-type units will be incorporated into other types of disks.

BASF's revenues are pretty evenly split between flexible and hard media, Healion said. In addition to disks, the plant makes floppy disks and computer and audio tape in reels and cassettes.

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Vendors Differ on Distributed Processing Definition

(Continued from Page 30)

tems that are stand-alone minicomputer networks, not front-ending to a host, he said, but there are certain large computers that may tie into the net.

In the future, the network itself will become the processing medium and what was formerly the host will just become another node in the network, Bonne predicted.

Networks will replace host computers and front-end types of systems along with the evolution away from centralized data bases, he said, noting the Bank of America is distributing a data base of 25 billion characters into over 30 different systems.

"With minis and micros now supporting large file systems, there is less and less of a reason for having one centralized data base," Bonne believes.

The evolution at GA is toward large communication networks that are very modular, he said. The modules, which may have one, two or up to six minicomputers, will handle redundancy, recovery and nonstop operation as GA begins to provide software enabling the modules of multiple minis to work together as a single processing entity.

Power Near Transaction

Ed Gistaro, vice president of marketing for Datapoint Corp., said DDP is "the concept of putting computer power closer, if not at, the actual site of business transactions."

DDP "came about with the availability of low-cost, easy-to-use computers that were operator-oriented, not Buck Rodgersish," he added.

The main function of the mainframe in Gistaro's concept of DDP is data base maintenance, which provides a central focal point, while distributed points maintain regional or departmental data bases as well.

"We're not talking about usurping mainframes, but rather about making data more usable by cleaning it up before it gets to the mainframe," as well as putting data back into the hands of the people who need and are interested in it, he said.

Eyeing the future, Gistaro said vendors must keep in mind that users have spent so much time and money getting their act centralized they cannot decentralize overnight.

Donn Ulmer, president of Century 21 Data Systems, a Microdata Corp. distributor, thinks the entire concept of DDP evolved because users could not control information from a central standpoint and were not getting the response time they needed.

Microdata's approach to DDP is to provide a stand-alone system with communications capabilities because of the power inherent in the system, he said. The firm is not dealing with "General Motors" companies, but with unique entities for which communications on a batch basis is sufficient, he noted.

Microdata's system will allow on-line operations, he added, but the firm is selling more batch systems because of the lower cost.

Minis will be accessing a central data base to a certain extent, but to a much greater extent each installation will maintain its own information, in Ulmer's schema.

"The concept is young enough now that it will take a couple of pioneers to get it truly off the ground," he said, noting that for "political" reasons "number crunchers" will stay around for a while because DP centers will have to justify their in-house IBM 370s and because they want to maintain overall control.

But, he added, this will be harder and harder to do as more minis capable of handling 5M-byte data bases come along.

More Than Terminals

Computer Automation, Inc. believes DDP entails placing "substantial computing power" in terms of input medium at the point of action as opposed to just data entry with an intelligent terminal, according to Carsten Brydum, communications marketing coordinator.

While data capture and data entry are sufficient to justify a DDP system, remote divisions now want to do more with the massive capability a full-powered mini can give them, he said.

Jim Mezger, marketing manager for Data General Corp., said his was the classical minimaker's view. "That means we are selling effectively to organizations that have large centralized systems, but can't seem to get the computing power that is there to work for them."

Remote Users the Key

Noel O. Kile, vice-president of marketing for Qantel Corp., defined DDP as "allowing remote locations to handle their own processing and submit summary information to headquarters on a periodic basis."

Remote users with minis rather than just terminals can have today's information today and headquarters can have the summary information it needs without excessive paper load, he said.

For Cummins-Allison Corp., DDP means "the processing of information in the most efficient and economical manner by the people or departments who need access to that information," according to William J. Hautigan, sales promotion manager.

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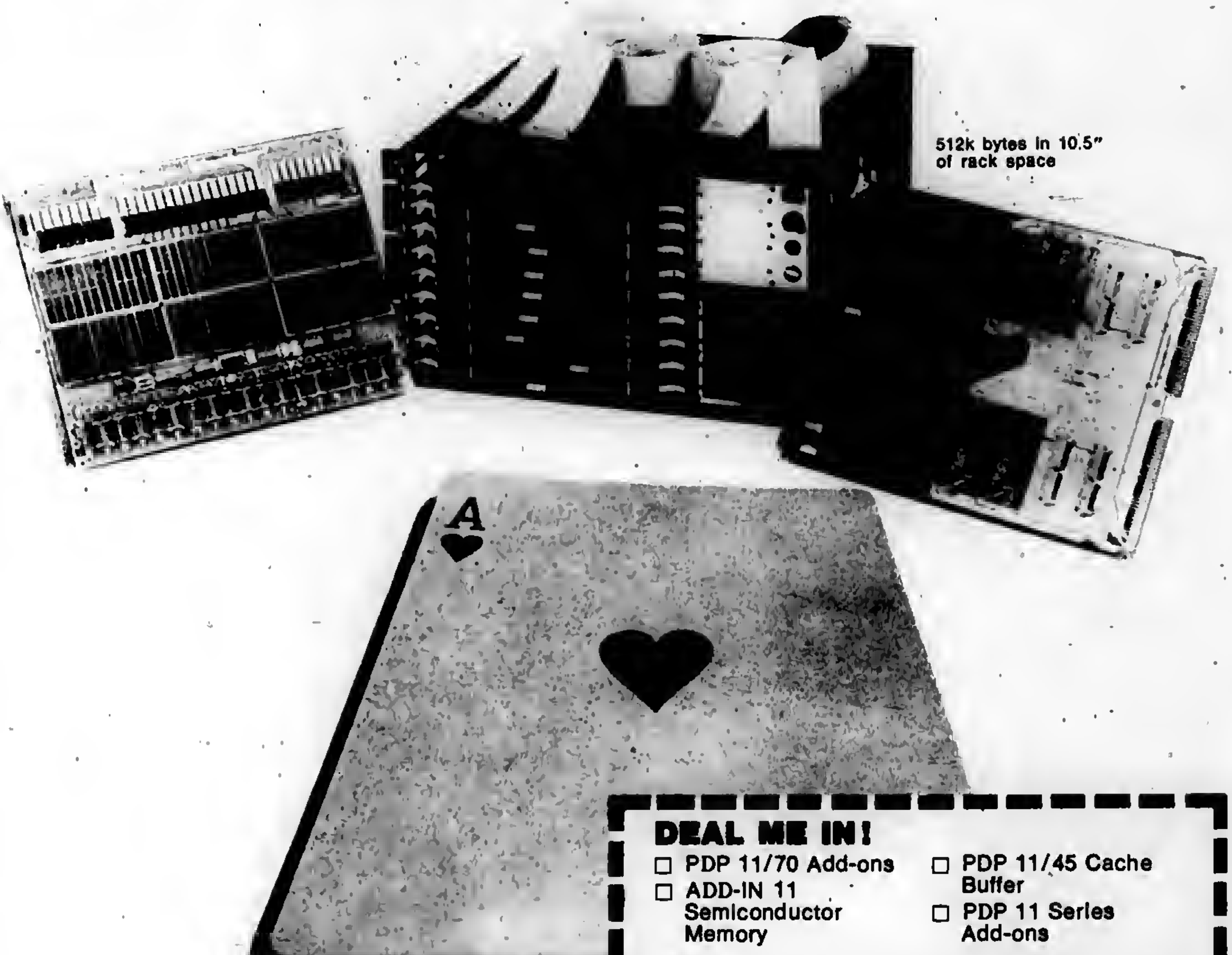

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Pigskin Processing

WESTBOROUGH, Mass. – Data General Corp. (DG) took to the air to defeat rival Interdata in the third annual Databowl flag football game between the two firms recently.

DG was ahead from the start; the final score was 38-6. Interdata fought back in the second half and held DG to only one touchdown. Taking a page from DG's book, Interdata passed for a touchdown in the last half.

Interdata spectators, who bused up from New Jersey, outnumbered the tiny contingent from nearby DG. However, on the field, DG had at least two good passers and a galloping receiver with "great hands." The combination proved unbeatable. The Interdata team had not played before the game, although it had held some scrimmages.

Interdata Captain Dick Vivian acknowledged DG's prowess on the field and muttered, "Wait until next year."

With One-Stop Shopping

Shift Seen in Distribution of Terminals

BRIDGEPORT, Conn. – There is evidence the terminal industry is on the verge of a shift in distribution which can have enormous implications for the consumer, according to Joseph Sorrentino.

Small computer manufacturers and computing equipment users who want to purchase nationally known products and have them serviced under one contract are creating a new echelon in the distribution process, the president of Computer Peripheral Corp. (CPC) said.

This echelon is being served by one-stop terminal "supermarkets" that offer national distribution on a variety of brands and the ability to provide nearby service when equipment goes down, he explained.

CPC is such a company, offering three major lines of CRT terminals including those from Lear Siegler, Beehive and Hazeltine along with Okidata and MI^2 printers.

There is a growing number of companies like CPC "which are moving the manufacturer one echelon back in the distribution process so they are becoming the providers for the system, rather than functioning in their traditional role as its master," Sorrentino said.

"The need to know more about a business – and quickly – is creating increasing requirements for access to company computers at all levels, albeit with widely differing information needs.

"These applications variations are producing the expanding need in the marketplace for the multibrand showcase of terminals and equipment to meet the specific requirements of the application. This is where the supermarket-type terminal distributor is serving and thriving," Sorrentino said.

He believes his company's early success stems from being able to provide "the right terminal for the customer's application, when he wants it, and being able to be there with immediate service when a terminal has trouble.

"Substantial savings are achieved in negotiating only one service contract instead of a half dozen," Sorrentino said.

Evaluation Task

Sorrentino said it has been his experience that customers also like the way such distributors stay on top of developments in the terminal field and evaluate new products for their possible application.

"This," he explained, "is because terminal users are limited by the amount of time they can spend on keeping abreast of advancements. Companies like ours have to do it regularly – it's the way we stay in business – and the customer benefits through time saved and quicker introductions of innovations to their particular business needs."

Less than a year old, CPC has already expanded into 19 metropolitan markets.

"We're growing and moving rapidly because we feel we're blazing a trail with a few other companies. Soon there will be many more entering this field who will run close on our heels," Sorrentino said.

Executive Corner

- Dause L. Bibby has been elected chairman of the board of directors of Decision Data Computer Corp.
- Dr. William C. Leone, Thomas J. Klutznick and Harry G. Bowles have agreed to join the Datapoint Corp. board of directors.
- Donald L. Eichler has been named to the board of directors of On-Line Business Systems, Inc.
- Edward G. Uhl has been elected chairman of the board and chief executive officer and John F. Dealy has been elected president and chief operating officer of Fairchild Industries, Inc.
- Jerome Drexler and Robert Hallock have been elected to the board of directors of Precision Monolithics, Inc.
- Arthur R. Garofalo has been appointed president and general manager of MCS Infodevices, Inc.
- D.K. Ritchie has become president of ESE Electronic Systems, Inc.
- Darryl J. Dillenback has been promoted to vice-president of manufacturing for Magnetic Windings Co.

Seeing where you've been can show you where you're going.

Read the *Year-End Review and Forecast* in the combined December 27th/January 3rd issue of *Computerworld*.

As the once-in-a-lifetime U.S. Bicentennial approaches its demise, it's time to sit back and look beneath the headlines for the truly significant events of 1976. Beyond those tall ships, giant cakes and candidates, what really happened to shape and direct this historic year? If you're involved with computers, you'll find answers that affect you in *Computerworld's* Year-End Review and Forecast, appearing in the special, combined issue of December 27/January 3.

Edited by E. Drake Lundell, this special issue will be filled with useful analysis and insightful commentary on the year's most compelling computer stories. To name just a few items, this report will cover the latest developments in computer hardware, software and communications; the effect that recent (and pending) legal decisions and/or federal policy revisions may have on the industry as a whole; and the way computers are changing our society. In addition, a variety of experts will be on hand to help shake the dust from *Computerworld's* crystal ball, and give you knowledgable forecasts of important events that are likely to occur in 1977. It's all coming your way December 27th -- and if you're involved with computers, you'll find articles, newsnotes, commentary and summary that will interest and inform you.

And if you're marketing products or services to the people who use computers, your ad should be a part of this unique special issue. Contact your *Computerworld* salesman for complete details. Or call Judy Milford at (617) 965-5800 to place your ad, and start a beautiful 1977.

COMPUTERWORLD

Boston	**New York**	**San Francisco**	**Los Angeles**
Bob Ziegel	Don Fagan	Bill Healey	Bill Healey
Mike Burman	Frank Gallo	Jim Richardson	Jim Richardson
(617) 965-5800	(201) 461-2575	(415) 495-0990	(213) 477-3535

POSITION ANNOUNCEMENTS

International Corp. consolidating their data center in Houston seeks the following:

EDP Audit Mgr.	$25M
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20 ANALYST & PROGRAMMERS with salaries $14 to 20M. This Co. is installing 370/168 IMS, TSO, MVS systems. This Co. offers the best in benefits & future growth potential. This is a rare oppor. to join a very progressive firm.

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Very successful consulting firm urgently seeks talented, flexible p/a's to work with major client companies and banks. High visibility, fast track, no overnight travel. Must have 2 yrs + COBOL, IBM or Honeywell, broad variety in applications experience. Salary $12-18,000 depending on background. Other openings for p/a's with mini familiarity. Fee paid, of course.

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OF GREATER STAMFORD
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(203) 357-8288

Faculty Position: Department of Physics and Computer Science, Murray State University. Ph.D. in Computer Science or related field required. Teaching and industrial experience desirable. The successful candidate will be expected to supply theoritical support to an applied computer science program. Rank and salary dependent upon qualifications. Send application including resume, three references, undergradudate and graduate transcripts to Dr. Robert C. Etherton, Chairman, Department of Physcis and Computer Science, Box 2109 University Station, Murray State University, Murray, KY 42071. Applications received after January 15, 1977, may not be considered.
Equal Opportunity Employer M/F

ASSISTANT PROFESSOR OF BIOLOGICAL CHEMISTRY AND DIRECTOR OF RESEARCH COMPUTER FACILITY.

Responsibility for operation and further development of Research Computer Facility serving multiple users; opportunity to develop new programs; graduate level teaching. Ph.D. with relevant experience required. Position open January 1, 1977. Send resume and two letters of recommendation to Dr. Eugene A. Davidson, Dept. of Biological Chemistry, The Milton S. Hershey Medical Center, The Pennsylvania State University, Hershey, PA 17033 USA
An Equal Opportunity Employer

SENIOR PROGRAMMER ANALYST

Major manufacturer of electrical control devices looking for a data processing professional who has a minimum of 4 years manufacturing experience. Candidates should have an understanding of manufacturing systems including B/M Processor, M.R.P., C.R.P., S.F.C., COBOL, T/P and P.I.C. user experience a plus. Send resume and salary history to Employee Relations Manager, 2901 Industrial Drive, P.O. Box 1158, Bowling Green, KY 42101, (502) 842-6511.

An Equal Opportunity Employer M/F

PROGRAMMER/ ANALYST

General Cable Corporation. . .with a modern facility in suburban Denver. . .is a well-established, stable and continuously expanding leader in the design and manufacture of mobile utility equipment.

We're currently expanding our data processing department and need an experienced programmer/analyst. You should have two years of experience in a manufacturing environment. You'll need BOMP and RPGII experience. An Associate degree is preferred, and MRP experience will be a plus.

You should have proven ability to organize and implement analysis and programming tasks with maximum efficiency. You'll work closely with all the departments in our facility.

We offer excellent company paid benefits, modern working conditions, and a competitive starting salary. To apply, please send your resume to: Personnel Manager, General Cable Corporation, 5600 W. 88th Ave., Westminster, Colo. 80030.

GENERAL CABLE CORP.
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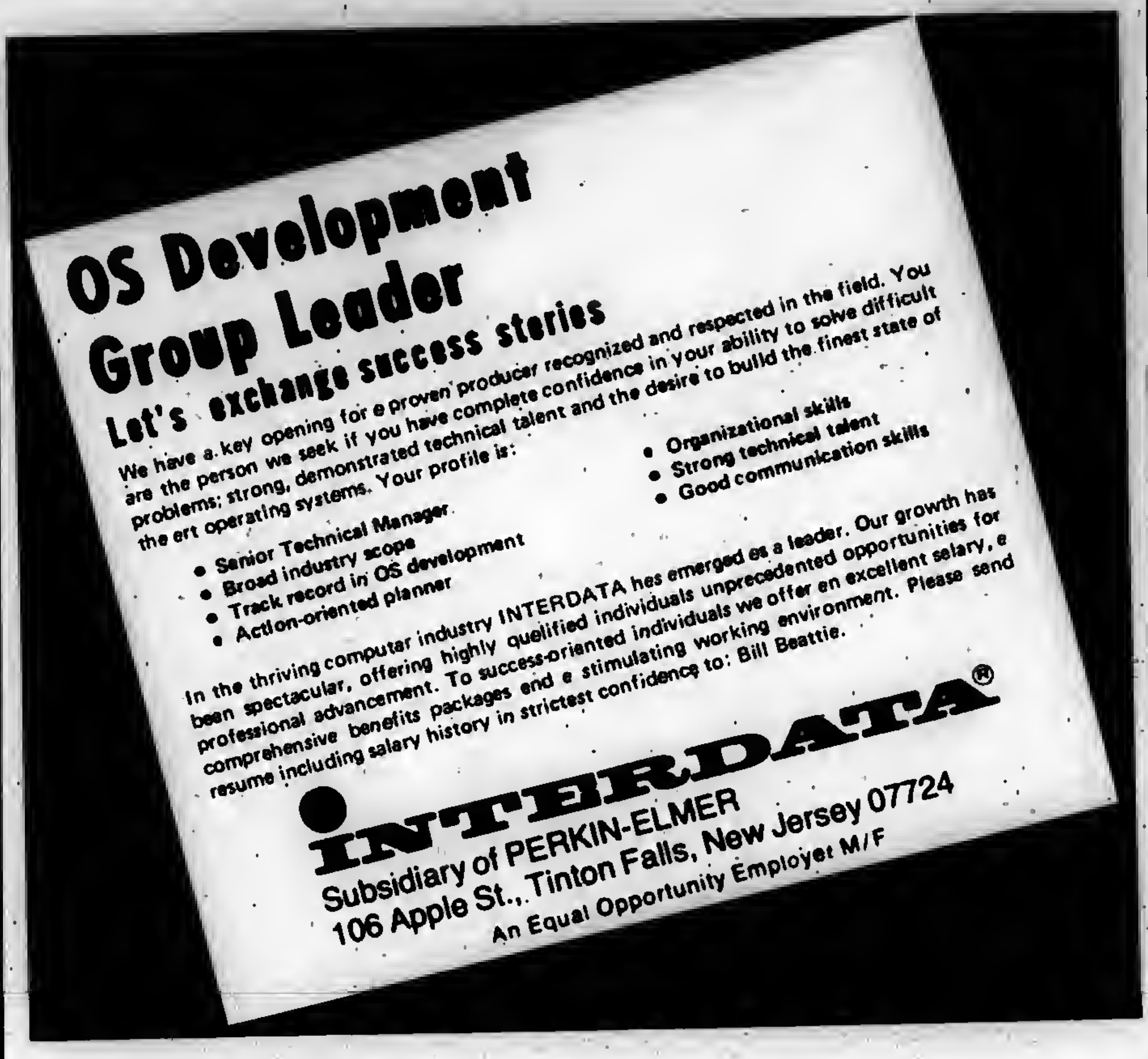

OS Development Group Leader

Let's exchange success stories

We have a key opening for a proven producer recognized and respected in the field. You are the person we seek if you have complete confidence in your ability to solve difficult problems; strong, demonstrated technical talent and the desire to build the finest state of the art operating systems. Your profile is:

- Senior Technical Manager
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In the thriving computer industry INTERDATA has emerged as a leader. Our growth has been spectacular, offering highly qualified individuals unprecedented opportunities for professional advancement. To success-oriented individuals we offer an excellent salary, a comprehensive benefits packages and a stimulating working environment. Please send resume including salary history in strictest confidence to: Bill Beattie.

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If you are interested in relocating to the beautiful Pacific Northwest, we currently have several excellent positions for EDP professionals with banking experience. The following represent a small sampling of current opportunities.

V.P. - EDP Manager . . . . . to 40K
Systems Analysts . . . . to 25K
Analyst Programmers . . . . to 22K
Programmers . . . . to 20K

Contact Jim Morris or Bill Parfitt, Houser, Martin, Morris and Associates, 1621 114th S.E., Suite 219, Bellevue, WA 98004. (206) 455-9600.

UNIVERSITY POSITION
PRODUCTION SERVICES MANAGER

Responsibilities include planning, organizing and directing the day-to-day production activities of a major University Computation Center.

Among the REQUIRED QUALIFICATIONS for this position are:

1. Ability to establish and maintain affective relationships with employees;
2. Experience operating and/or managing a large-scale computer system.

DESIRED QUALIFICATIONS include:

Undergraduate degree or equivalent training and experience.

Salary range is
$16,000-$19,000 per annum

RESUME to John K. Seitz, University of Kansas Computation Center, P.O. Drawer 2007, Lawrence, Kansas 66045, on or before December 1, 1976.

THE COMPUTATION CENTER IS AN EQUAL OPPORTUNITY EMPLOYER. QUALIFIED MEN AND WOMEN OF ALL RACES ARE ENCOURAGED TO APPLY.

COMPUTER CORPORATION OF AMERICA

We're doing exciting things at CCA! We're developing technology for ultra-large data base systems with state-of-the-art mass memory concepts; we have the most advanced data base management product on the market; we're working on distributed data base management technology for nationwide computer networks - and much, much more. If you have been seeking a dynamic environment and more challenge in a growing company, consider the positions we have immediately available.

COMPUTER SCIENTIST

To manage our distributed data base research and development effort and to conceptualize new approaches and techniques. Established expertise in data base management technology is required. A PhD in Computer Science is strongly preferred.

NATIONAL SALES MANAGER

To direct and coordinate software product sales, customer technical support, and marketing support; and to hire, train and manage a geographically dispersed sales staff. Experience in DBMS sales, supervision and training of a sales staff, and knowledge of data base management are strongly preferred.

SYSTEMS PROGRAMMER (PDP-10)

To maintain a TENEX system and to install a large, complex applications system on additional TENEX and TOPS-20 sites. The position requires three or more years systems programming experience, and a knowledge of TENEX and/or TOPS-20 is strongly preferred.

SYSTEMS PROGRAMMER (PDP-11)

To assume full responsibility for the design and implementation of a unique communications interface system. The position will provide significant opportunities for advancement. We are seeking an enthusiastic person who has PDP-11 systems programming experience and a telecommunications background.

Please send resume, including salary requirement, to
Lynn Moulton, Personnel Director

Computer Corporation of America
575 Technology Square
Cambridge, Mass. 02139

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PROFESSIONALS

University Medical Center known for progressive ideas in the health care industry is seeking growth oriented professionals for the following positions:

1. DIGITAL ELECTRONIC ENGINEER-will be involved with design and development of digital circuitry for advance medical application. MS degree or equivalent experience.
2. PROGRAMMER-To work micro-processor PDP-11, assembly language knowledge desirable BS, MS or equivalent.

We offer excellent starting salaries commensurate with experience. With one of the finest benefit programs around, including 4 weeks paid vacation after the first year.

Send complete resume to:

Phil Olsen
Rush Presbyterian-
St. Luke's Medical Center
1725 West Harrison Rm 346
Chicago, Illinois 60612

UNIVERSITY OF PETROLEUM & MINERALS DHAHRAN, SAUDI ARABIA

The Department of Systems Engineering, University of Petroleum and Minerals, Dhahran, Saudi Arabia, will have faculty positions open for the Academic Year 1977-78, starting 1 September 1977. Candidates with PhD degrees preferably with teaching experience are invited to submit their applications. English used for instruction.

Minimum regular contract for two years, renewable. Competitive salaries and allowances, free air conditioned and furnished housing, free air transportation to and from Dhahran each two year tour. Attractive educational assistance grants for schoolage dependent children. Local transportation allowance in cash each month. All earned income without Saudi taxes. Ten-month duty each year with two-month vacation paid and possibility of participating in University's ongoing Summer Programs with adequate additional compensation.

Apply with compete resume on academic and professional background, list of references, publications and research details, and with copies of degrees/testimonials, including personal data, such as, home and office addresses, telephone numbers, family status (names of children, age and sex) to:

University of
Petroleum & Minerals
c/o Saudi Arabian
Educational Mission
2223 W. Loop South, Suite 400
Houston, Texas 77027

NCR's newest facility, the Data Processing Division in Wichita, offers growth opportunities for ambitious individuals to work on state-of-the-art, next generation, small business computer systems and associated equipment. Wichita's cost of living is up to 30% less than most major eastern cities. Wichita's air is among the cleanest...school systems are among the finest in the country. We welcome an opportunity to discuss employment with you!

SENIOR DATA BASE MANAGEMENT ENGINEER

Minimum of 5 years experience in implementation of a data base management, operating or communications system. High degree of visibility within the organization reporting to the Advanced Development Manager.

SYSTEMS SOFTWARE PROGRAMMERS

- Communications
- File Management
- Minicomputer Operating Systems
- Firmware Development
- Diagnostic Systems Designers
- Compiler Designers
- Assembly Level Programmers

SYSTEMS HARDWARE DESIGN

- Real-time Architectures and Development with experience with on-line minicomputer applications.
- Network Design and Communications Control for Distributed Processing Systems.
- Minicomputer Hardware/Software Design Trade-off.
- Terminal and Peripheral Interface Design.

NETWORK DESIGN

- Node Control
- Distributed File Management
- Terminal Handling
- Computer Communications

SEMICONDUCTOR COMPONENT ENGINEER

3 to 5 years experience with emphasis in:

- Evaluation and Specification of Semiconductor Components
- Discrete, Digital and Linear IC's

DESIGN AUTOMATION ENGINEER

- BSEE degree with minimum of 3 to 5 years experience.
- Familiar with Fortran, Logic Simulation, Systems Simulation, P.C. Board Design, and Automated Bill of Materials.

COMMUNICATIONS SYSTEMS ENGINEERS

A degree in engineering, computer science or equivalent is required with preference being an advanced degree. An EBA would be a substantial asset. Applicant must have strong systems orientation and substantial experience with communication systems. In-depth knowledge in one or more of the following areas are desired:

- Operating System Provisions toward communication, including communication access methods.
- Communication processor architecture.
- Communication link disciplines.
- Communication systems diagnostics.

Send resume including salary history to: Max Anderson, Professional Placement, Dept. CN, 3718 N. Rock Road, Wichita, Kansas 67226.

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NCR
Data Processing Division — Wichita

Systems Analysts

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San Francisco

These positions raquira edvisory level experience, comprehensiva systems dasign and implementetion, user sensitivity, end a high celiber of professionelism.

You will work in 370/168, MVS, IMS, DL-1, COBOL, online anvironmant on financial applicattons.

In return for your contribution othar factors includa: axcellent career devatopmant, extrematy attractive fringe benefits (including intarvlaw and relocation axpanses paid), and a salary to $25,000.

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Diagnostic Programming Supervisor PDP 11, Systams tast - $23K
Programmers, PDP 11 Assembly - $16K
Projact Leaders, PDP 11, Assembty - $23K
Project Managar, Senior Analysts, Programmers for Banking applications, larga scate CICS, CPCS, 370-OS & DOS to $22K
Manager Systems & Programming 370/158 OS to $30K
Project Leadars, Programmars 370, OS, IMS Financiat background to $22K

Many positions too numerous to list. Our client compenias offer package peid, excellent environment end challenging caraar opportunities. Submit resumes in confidence stating selery requirements to:

PAUL RILEY V.P.
DATA SCIENCES PERSONNEL, INC.
15490 N.W. 7 Ave.
Miami, Fla. 33169
(305) 685-7891

INTERNAL AUDITOR EDP

Able to Evaluate Adequacy of Controls Within Computer Systems

Responsibilities will be in the arees of evaluating policies, procedures, end systems design as they affect the security end reliebility of controls built in to provide proper protection ageinst error, interference, or abuses.

Evaluetions will be performed routinely with respect to eny chenge or eddition in eccounting or information systems, end audits will be done periodicelly or in response to specific problems. Utilize broad knowledga of EDP systems end auditing techniques tu perform essignments without close supervision.

At laest 5 yeers experlance in computer systems or 3 directly in computer-besed systams euditing is raquired, with degree in Business Administration or Computer Science. Previous eudit function background in EDP systems is highly desirable.

Please send resume in confidence, indicating selary record, to:

EMPLOYMENT MANAGER
PIZZA HUT, INC.
P.O. Box 428
Wichita, KS 67802
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APPLICATIONS PROGRAMMER/ ANALYST

A rapidly growing, well esteblished data center in Floride with dual processor B-6700 on-lina environment with multistete terminal network seeking individuals with strong financiel applications background. Must hava minimum two years experience in COBOL with S&L or commerciel bank experience on medium/larga scala system.

Send resuma to D.R. Thrush, Personnet Manager, P.O. Box 1547, Orlando, FL 32802. *Equal Opportunity Employer*

DATA BASE PROGRAMMERS

We are a leading computer software compeny in en attractive Texas location with immediate openings for systems programmers who have the interest, talent, and experience required to design and implement a large-scale comprehensive data base management system.

Significant IBM, Honeywell, or mini-computer systems programming experience is important.

If you would like the unique opportunity to contribute to state-of-the-art software development with other highly-motivated professionals, please send us your resume today.

MRI SYSTEMS CORPORATION

P.O. Box 9968
Austin, Texas 78766
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manager systems/ computer services

A manager is being sought with demonstrated management ebility and successful experience in menagement of a mejor Systems and Computer Sarvices Departmant. Experience must include: supervision of data processing end systems personnel; menegement of major projects; budgeting and utilization of resources. Familiarity is highly desireble with IBM 370-145 DOS/VS utilizing DL-1 end CICS and interfecing of mini computers with this system. Reporting et the Vica Presidential level, salary will be commansurete with level of responsibility essumed.

Our Compeny is en investor owned combination utility (electric-naturel gas-wetar) heedquartared in Spokene (populetion 170,000) serving 26,000 squere miles in northeastern Weshington and northern Idaho. The successful 'results oriented' cendidete selacted will experience the ultimete opportunity for chellenging work within en ideel living environment. Interested applicents should submit a description of mejor project responsibilities, confidentiel resume end salary history to: Ted Hemilton APS, Employment Representative, P.O. Box 3727, Spokane, WA 99220.

The Washington Water Power Co.

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If You're Open To New Techniques and Ideas-

You Should Be At Digital-Marlboro

We're the Software Support Group for the large computer systems – DECsystem-10 and DECsystem-20 and networks. We pride ourselves in being a repidly growing, technically-integreted group that has earned the respect of our entire corporation.

If you appreciate working in en exciting and innovative atmosphere, then you should investigate Digital-Marlboro.

Software Product Services Analyst

In this high-visibility position, you'll be a major contributor to the internal planning of our systems software, primarily DECsystem-10, Decsystem-20 and networks. You should be an independent, assured professional, able to take en idea or set of product date and create support requirements, marketing projections, financial considerations, training needs and manpower capability requirements. Since you'll be expected to communicate with various levels of management, good interpersonal skills are essential.

A very strong Planning background is a must for this analytical assignment, as is solid technical/computer experience. To meet the challenges of this position, you should be a well-seasoned veteran with at least 4 years experience in technical support planning, also including merketing concepts, and be willing to accept considerable responsibility.

This is an excellent opportunity to become en integral part of our rapidly growing Software Services Group.

Software Product Support Specialists

We currently have several excellent opportunities available for technical skilled Software Support professionals in the areas of:

- Communications & Networks
- Commercial products & applications
- Scientific languages
- User applications

You'll be supporting our DECsystem-10, Decsystem-20 and networks field specialists worldwide, primarily solving customer problems either et our Marlboro facility or on site. In addition, you'll interface with users, technical, marketing, and development personnel and, supported by our highly respected Software Services Group, will solve user problems based on technical requirements. If you appreciate a real technical challenge and are growth and result-oriented, this is the position you've been waiting forl

To qualify, you should have at least 3 years experience in operating and maintaining large systems, preferably the DECsystem-10, DECsystem-20 and networks. Excellent interpersonal skills, leadership ability and solid technical knowledge are also essential. Some travel will be required; fluency in e second language helpful, but mot mandatory.

For an appointment, forward resume outlining salary requirements and indicating position desired to Douglas H. D'Agata, Digital Equipment Corporation, 200 Forest St., Marlboro, Mass. 01752.

digital

digital equipment corporation

Programmer/Analyst

Join GenRad's M.I.S. Department. Our computer is an IBM 370/145 with VS-1 running IMS/VS, DB/DC. Apply now for this career opportunity at our Concord facility just off of Route 2.

You will be involved in all phases of applications programming concepts and practices plus will participate in systems design with others. You will plan the interaction of complex program modules and write the related job control language to the OS environment. Manufacturing and/or financial background with IMS experience is desirable. PL/1 or COBOL experience is required. A minimum of three years experience in programming to qualify.

GenRad, an international corporation, produces high quality instrumentation and systems for industry. Many potentials for recognition and advancement, plus an excellent benefits package, are offered with this career opportunity.

Please send your resume in confidence to our Personnel Department at 300 Baker Avenue, Concord, Mass. 01742.

An equal opportunity employer M/F

GenRad

Coordinator
Academic Computing Services

Duties: Assist faculty and students in computer usage for instruction and research; develop software for academic use; prepare documentation of academic computing services; supervise student workers.

Qualifications: MS in Computer Science or related field; knowledge of several programming languages; experience with statistical packages; familiarity with timesharing systems; ability and desire to work with students and faculty.

Send resume with salary requirements by November 30, to:

Personnel Office
Southeast Missouri State University
Cape Girardeau, MO 63701

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JACK EDWARDS has held positions in the life insurance industry from Programmer to Director of Data Processing and Sr. Systems Consultant. Contact Jack for a personal, confidential discussion of todays best opportunities. No obligation, let's just talk about your career.

If you have experience in:

- COBOL or BAL Programming
- Life Insurance Daily Cycle
- DOS/OS JCL
- Agency or Accounting Systems
- Actuarial applications
- Pensions
- Investments/Financial Applications
- Project Management
- CFO, Life/70, LIFE-COMM, ALIS

I'd like to hear from you. Introducing quality people to quality companies is my business. Several locations. Call or write today.

RANDOLPH (JACK) EDWARDS
F.L.M.I.

DATA PROCESSING CAREERS,

7715 Chevy Chase Dr., Suite 125
Austin, Texas 78752
(512) 452-0971
Personnel Consultant

Senior Technical Specialist

This is your opportunity to get in on the ground floor of Digital's expanding LSI Development Program. In this wide-ranging position, you will provide technical support, mainly in the area of Software, to our LSI-11 sales specialists. Your responsibilities will include sales training, developing sales aids, delivering seminars, and giving application-oriented software consultation. Some travel will be necessary, as you'll be interfacing regularly with Engineering, Sales, and users.

You must have a good general knowledge of small systems software, and either Software Applications or real-time experience. A Bachelor's degree in Mathematics, Computer Science, or equivalent, is required. A knowledge of PDP-11 software, particularly RT-11 and RSX-11, plus FOCAL, BASIC, and/or FORTRAN are desirable.

Forward resume outlining salary requirements to Douglas J. D'Agata, Digital Equipment Corporation, 200 Forest St., Marlboro, Mass. 01752.

digital
digital equipment corporation

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Computer/Communications
Software Professionals

HELP US BUILD THE WORLD'S LARGEST APL TIME SHARING SYSTEM

Scientific Time Sharing Corporation introduced Interactive APL time sharing to the business community in 1969. We have been the pacesetter ever since, and our continued leadership is verified by an exceptional growth record. Now we're on the threshold of a bold new era of dynamic expansion.

We have purchased and installed an Amdahl 470 V/6 to meet growth requirements generated by new customers and exciting new applications of our APL*PLUS® Time Sharing Service. More big things are coming, and we need your help to make them happen. To carry out our plans to make APL*PLUS Service even more useful and powerful, we are seeking nine software professionals. More specifically, we're looking for:

- **Manager of Systems Software**
- **Manager of Communications Software**
- **Senior Systems Programmers**
- **Systems Programmers**
- **Communications Software Programmer**

Requirements range from 3 to 8 years of operating systems software experience (MVT/SVS/MVS) and communications software experience (IBM 3705, front end processors). APL systems and internals experience is highly desirable. Experience with time sharing systems and hardware performance measurement would also be very helpful.

You will be based at our headquarters in Bethesda, Maryland, a superior residential suburb of Washington, D.C. Our working environment is extremely creative. You will enjoy our kind of disciplined informality that breeds results and keeps stimulating you to greater achievement.

Let's talk. Local interviews can be arranged. Send your resume and salary requirements in confidence to: Jonathan D. Lezarus, Director of Systems Development.

Scientific
Time Sharing
Corporation

7316 Wisconsin Avenue, Bethesda, Md. 20014
An Affirmative Action, Equal Opportunity Employer M/F.

Programmer/ Analyst

Manufacturing Company located in Northwest Arkansas is looking for a programmer/analyst who would like to become involved with Manufacturing systems. (MRP, Shop Floor Control, etc.). Should have 1-1/2 to 2 years programming in RPG II. Send salary requirements and resume to:

Personnel Department
Shakespeare of Arkansas
P.O. Box C
Fayetteville, Arkansas 72701

Faculty Position: Department of Physics and Computer Science, Murray State University. Ph.D. in Electrical Engineering or related field required. Teaching and industrial experience desirable. The successful candidate will be expected to establish an undergraduate micro-processor and minicomputer laboratory. Rank and salary dependent on qualifications and experience. Send application including resume, three references, undergraduate and graduate transcripts to: Dr. Robert C. Etherton, Chairman, Department of Physics and Computer Science, Box 2109 University Station, Murray State University, Murray, KY 42071. Applications received after February 15, 1977, may not be considered. *EOE M/F*

MANAGER TECHNICAL DEVELOPMENT

Rapidly expanding international firm has an immediate opening for a person with 6-8 years experience in design and implementation of complex systems and an in-depth knowledge of systems design, operating systems technique and related hardware (370/158). SVS experience preferred, MVS experience helpful. Degree in a field related to information processing preferred. Salary 22-28K. Please send resume and salary history to:

CW Box 4828
797 Washington St.
Newton, Mass. 02160

Data Processing

Exceptional Opportunities In SYSTEMS

We are a large 700 bed teaching hospital with an active and growing Computer Systems Division. This position has both immediate and long term expansion goals encompassing the immediate development of a new major system and a total system planning effort within administrative and medical areas.

The following opportunities offer excellent salaries and benefit packages along with the unique opportunity to innovate and grow with us. All replies will be held in confidence.

Director Systems Development Section

Responsibilities include the overall management and development of this section along with planning new computer applications with various in-house divisions.

Requirements include a college degree, 6 years of experience encompassing the management of large, complex systems development projects and excellent written and oral communication skills.

SYSTEMS ANALYST

Your responsibilities in this important growth position include the defining, designing, and implementing new systems. In accomplishing these functions, you will report to and work closely with a senior systems analyst.

Requirements are 3 years of systems analyst and programming experience with a thorough knowledge of PDP-11 Computers, R.S.T.S. operating system and basic plus programming language. For this position a college degree and familiarity with health care systems is desirable.

PROGRAMMERS

You will be an important part of a professional team and work with systems analysts in developing and implementing new systems.

Requirements for this excellent growth opportunity include a minimum of one year of programming experience, minicomputer experience, some knowledge of PDP-11 Computers, R.S.T.S. operating systems and basic plus programming language.

Submit all resumes to Diane C. Lavine
Director of Employment

LUTHERAN GENERAL HOSPITAL

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The smart move is to Honeywell

Honeywell Level 6 Minicomputers

Our new femily of minicompulers ere en unquelified success. This kind of acceptance means unsurpassed opportunities for experienced minicomputer professionals. That's why, if you are reelly out to edvence your career, the smart move is to to Honeywell.

sales engineers

We're offering outstanding Sales Engineers unique opportunities to sell advanced Level 6 minicompoters with big company support. We're looking for experienced minicomputer Sales Engineers, with a BS in Engineering or its equivalent, and 3-5 years selling to OEM's, System Builders and large end users. You'll become part of a dynamic sales organization and receive an excellent salary and benefits, commissions and the the chance to grow rapidly.

systems analysts

The Level 6 minicomputer family brings outstanding opportunities to Systems Analysts. If you have 5-10 years sales support experience with minicomputers, a knowledge of assembly language, compilers and operating systems, it's an opportunity you'll want to thoroughly explore. With Level 6, we're on our way with all the signals ahead looking good.

Immediate openings in Chicago, Los Angeles, San Frencisco, New York City Area, Weshington, DC, Clevelend, Atlanta, Dallas, Boston, Philadelphia and other lerge cities.

For an immediate reply, please forward yoor resome to:
Kevin A. Keene, Honeywell Information Systems, Inc.,
M/S 425, 200 Smith St., Weltham, MA 02154.
An Equal Opportunity Employer

Honeywell

NCR

SPECIAL SYSTEMS DIVISION

New Positions in San Diego

The Special Systems Division of NCR located in Sen Diego, is involved in the development of on-line banking and retail systems. Current and future business commitments raquire that we edd severel systems analysts in the following categories:

Communications Software Development

These positions antail the system design and development of software for large communicetions natworks. Experience at ell levels in assembly language and a mini-computer background is nacessary. Experience in telecommunications, software and a related BS degree is preferred.

Software Support

Requires persons skilled in assembly languege, with a sound background in mini-computers to parform maintenence and field support of telecommunications networks. A number of these positions provide the opportunity for substential travel and customer contact.

Computer Systems Simulation

A position exists for a person with a minimum of two yaars' experience to perform simulation of computar systams and compilar performance measurement. This position requires knowladge of statistics and queuing thaory and programming experiance in languages such as Fortran, GPSS or Simscript. A related degree is preferred.

Please submit resuma including salary history to Bruce Bertsch, Menager, Industrial Ralations.

NCR

Special Systems Division
4045 Sorrento Valley Blvd.
San Diego, Calif. 92121

ANALYSIS/ PROGRAMMER

An Equal Opportunity Employer

A fast growing unit of local government that is home to the University of North Carolina (at Chapel Hill) is organizing a data processing department. Wa are looking for someone with experiance to head this agency. Prior government amployment would be helpful but is not nacessary. The salary is not fixed but will be commensurate with applicant's axperienca. A genarous fringe benefit package is provided.

Contact: S.M. Gattis
Orange County Manager
106 E. Margaret Lane
Hillsborough, N.C. 27278
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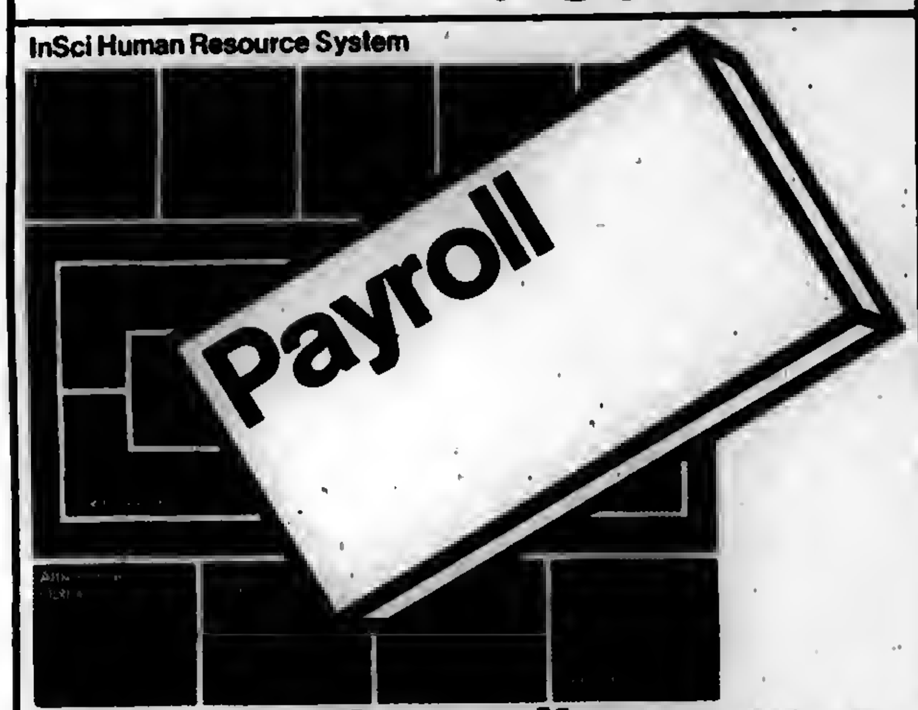

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InSci
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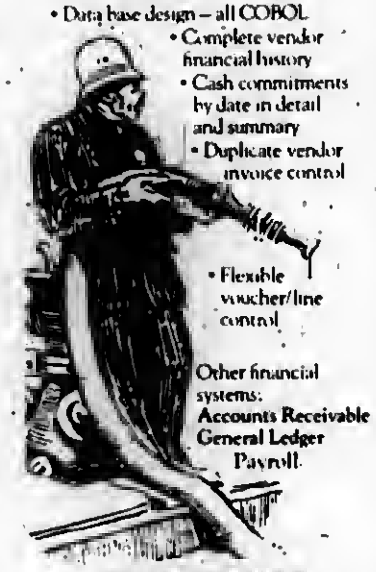

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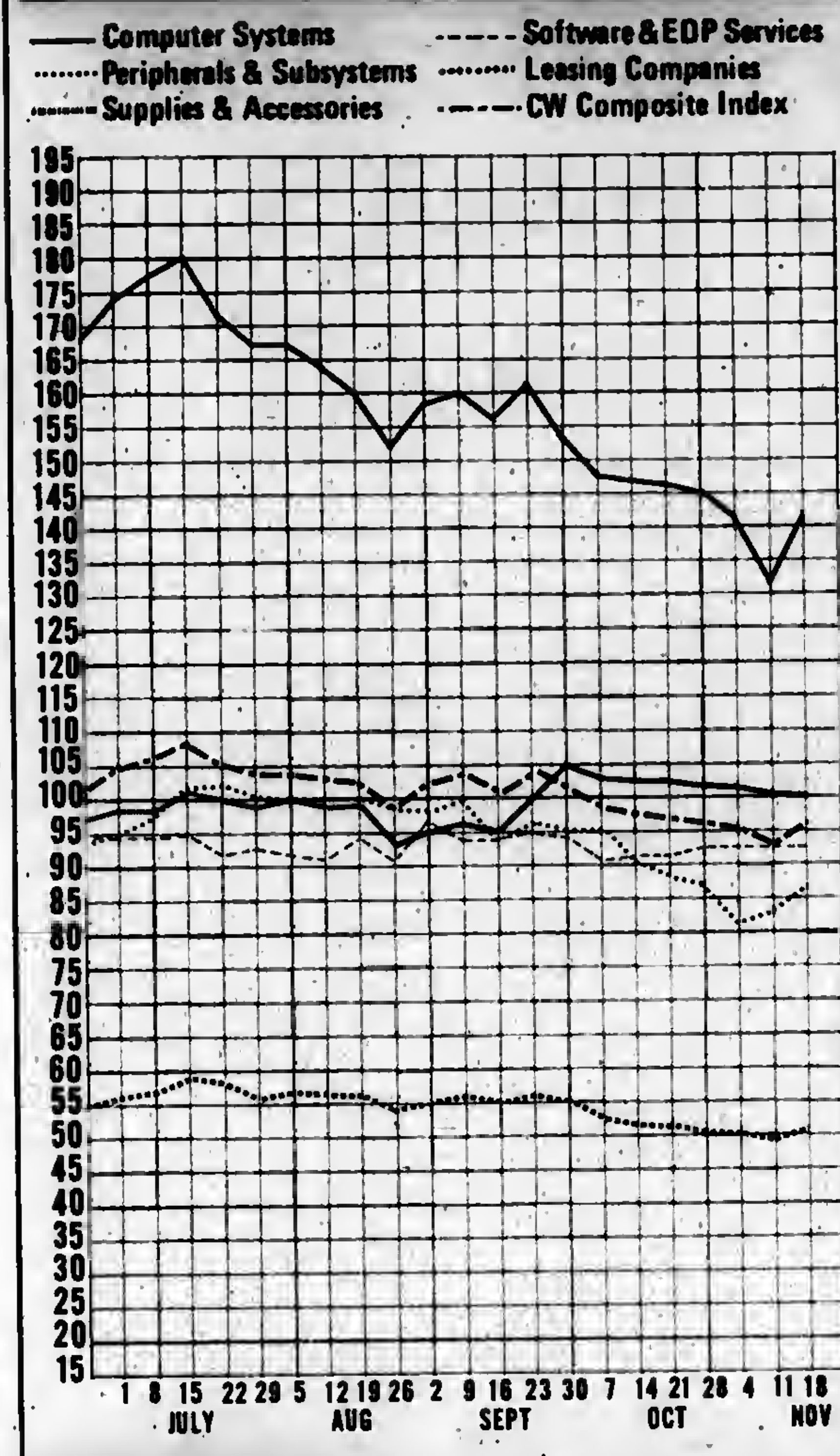

Earnings Reports

INCOTERM
Three Months Ended Aug. 28

	1976	1975
Shr Ernd	$.28	$.29
Revenue	8,873,000	7,999,000
Earnings	556,000	585,000
6 Mo Shr	.46	.65
Revenue	17,118,000	15,612,000
Tax Cred	......	193,000
Earnings	912,000	1,298,000

MEGADATA COMPUTER & COMMUNICATIONS
Three Months Ended July 31

	1976	1975
Shr Ernd	$.09	$.02
Revenue	1,427,000	840,000
Tax Cred	.....	6,890
Earnings	79,425	15,350
9 Mo Shr	.24	.....
Revenue	4,247,000	2,007,000
Tax Cred	.....	29,190
Earnings	194,672	82,754

MOHAWK DATA SCIENCES
Three Months Ended July 31

	1976	1975
Shr Ernd	$.19	$.31
Revenue	38,948,000	41,732,000
Tax Cred	545,000	685,000
Earnings	1,436,000	2,158,000

DATAPRODUCTS
Three Months Ended Sept. 25

	1976	1975
Shr Ernd	$.36	$.21
Revenue	28,181,000	20,209,000
Earnings	2,654,000	1,401,000
6 Mo Shr	.83	.45
Revenue	54,881,000	38,902,000
Earnings	a6,229,000	b3,132,000

a-Includes $1.1 million gain from sale of building. b-Includes $739,000 gain on sale of Data Card Corp. shares.

DECISION DATA COMPUTER
Three Months Ended Aug. 28

	1976	1975
Shr Ernd	$.12	.....
Revenue	8,721,000	$7,579,000
Earnings	440,000	a(663,000)
9 Mo Shr	......	.....
Revenue	25,542,000	30,426,000
Loss	152,000	d170,000

a-Includes $192,000 from foreign investment write-off.

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Tristanstrasse 11
West Germany
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Telex: W.Ger-5-215250-HKFD

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, NOVEMBER 17, 1976

All statistics compiled, computed and formatted by
TRADE★QUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		PRICE 1976 RANGE 111	CLOSE NOV 17 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	AMOAHL CORP	23- 30	27 7/8	+2 3/8	+9.5
N	BURROUGHS CORP	84-108	89 7/8	+4 3/8	+3.1
O	CONPUTER AUTOMATION	10- 19	14 1/R	- 1/4	-1.7
N	CONTROL OATA CORP	18- 27	22	+ 5/8	+1.7
N	OATA GENERAL CORP	40- 60	43	+1 1/2	+3.4
O	OATAPOINT CORP	24- 46	2R 1/4	+4 3/4	+20.2
O	OIGITAL COMP CONTROL	2- 7	3 3/8	- 1/8	-2.2
N	OIGITAL EQUIPNENT	46- 60	52 1/4	+3 1/4	+6.6
N	ELECTRONIC ASSOC.	2- 3	2 1/8	- 1/8	-3.3
A	ELECTRONIC ENGINEER.	7- 16	R	+ 3/8	+4.9
O	FOUR-PHASE SYSTENS	13- 21	14 3/8	+ 1/4	+1.7
N	FOXBORO	28- 50	44 1/2	+1 1/4	+2.8
O	GENERAL AUTONATION	4- 11	4 1/4	+ 1/8	+3.0
O	GRI COMPUTER CORP	1- 1	5/R	0	0.0
N	HEWLETT-PACKARO CO	80-117	R3 5/8	+1 7/8	+2.3
N	HONEYWELL INC	34- 56	43 1/2	+1 7/8	+4.3
N	IBM	227-28R	267 1/2	+6 1/2	+2.4
O	MANAGEMENT ASSIST	1- 6	5 3/4	+ 1/4	+4.3
O	MEMOREX	17- 55	1R 1/4	+ 1/8	+0.6
O	MICROOATA CORP	10- 28	14 1/8	- 1/2	-3.4
O	MOOULAR COMPUTER SYS	3- 14	3 3/4	+1 1/4	+30.0
N	NCR	24- 57	53 1/4	+ 3/4	+2.3
O	PRIME CONPUTEK INC	4- 14	14	+ 3/4	+5.6
N	PERKIN-ELMER	19- 27	19 1/4	- 3/4	-5.7
N	RAYTHEON CO	45- 67	60	+ 7/8	+1.4
N	SPERRY RANO	40- 52	44 3/8	+1 7/8	+4.4
O	SYCOR INC	9- 31	12 1/2	+5 1/2	+3R.8
A	SYSTENS ENG. LABS	5- 10	6 1/8	+1 1/8	+22.5
N	YARIAN ASSOCIATES	12- 17	13 1/4	+ 7/8	+7.0
A	WANG LABS.	11- 20	13 5/8	+ 1/4	+1.R

LEASING COMPANIES

EXCH		1976 RANGE 111	CLOSE NOV 17 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	BOOTHE COMPUTER CORP	1- 8	6 1/2	+ 3/8	+6.1
O	CONOLSCO INC	5- 10	9 1/2	+ 1/2	+5.3
A	COMMERCE GROUP CORP	2- 5	1 3/4	+ 1/8	+7.6
A	COMPUTEK INVSTRS GRP	1- 3	1 5/8	0	0.0
N	OATRONIC RENTAL	1- 8	7/8	+ 1/8	+16.6
A	OCL INC	1- 1	5/R	0	0.0
N	OPF INC	5- 8	6 7/8	+ 1/2	+7.R
N	PTEL	6- 15	12 1/2	+ 5/R	+3.2
N	LEASCO CORP	6- 19	18	+ 3/8	+2.1
O	LEASPAC CORP	0- 1	1/8	0	0.0
O	NRG INC	0- 1	1/8	0	0.0
A	PIONEER TEX CORP	6- 9	7 1/4	0	0.0
N	U.S. LEASING	7- 12	8 3/R	+ 1/4	+2.9

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
111 TO NEAREST DOLLAR

SOFTWARE & EOP SERVICES

EXCH		1976 RANGE 111	CLOSE NOV 17 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	AOYANCEO COMP TECH	1- 3	1	- 1/8	-11.1
O	ANACOMP INC	6- 11	6 3/4	- 1/4	-3.3
A	APPLIEO OATA RES.	2- 4	3 3/8	- 1/8	-3.3
N	AUTOMATIC OATA PROC	17- 35	27 1/2	+2	+7.8
O	COLEMAN AMERICAN COS	2- 6	2 3/8	- 1/8	-3.0
O	COMPU-SERY NETWORK	3- 10	R	-1 1/4	-13.3
O	COMPUTER OIMENSIONS	3- 7	5 3/4	0	0.0
O	COMP ELECTION SYSTMS	3- 9	3 1/4	+ 1/2	+10.3
O	COMPUTER HORIZONS	1- 2	1 1/2	+ 1/4	+20.0
O	COMPUTER NETWORK	2- 6	3 3/4	+ 3/8	+6.9
N	COMPUTER SCIENCES	4- 8	3 5/8	0	0.0
O	COMPUTER TASK GROUP	1- 2	1 1/4	0	0.0
O	COMPUTER USAGE	3- 6	2 3/4	+ 1/4	+10.0
O	CONSHARE	2- 9	3 1/2	+ 3/4	+13.7
O	OATA OIMENSIONS INC	2- 4	5	- 1/4	-7.6
O	OATATAB	1- 2	1 1/2	0	0.0
N	ELECTRONIC OATA SYS.	12- 18	13 7/8	+ 7/8	+3.8
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	INSYTE CORP	1- 5	1 1/2	+ 1/R	+9.0
O	IPS COMPUTER MARKET.	1- 2	1 1/8	- 1/4	-18.1
O	KEANE ASSOCIATES	2- 4	2 3/R	- 3/8	-20.8
O	KEYOATA CORP	1- 3	1 1/2	- 1/8	-7.6
O	LOGICON	5- 5	5	+ 1/4	+5.2
A	MANAGEMENT DATA	1- 3	2	0	0.0
A	NATIONAL CSS INC	13- 25	18	+ 1/4	+1.4
O	NATIONAL DATA CORP	4- 7	5	0	0.0
A	ON LINE SYSTEMS INC	17- 22	18 3/8	+1 3/8	+9.3
N	PLANNING RESEAKCH	3- 5	3 3/8	+ 1/2	+16.0
O	PROGRAMMING & SYS	1- 1	3/8	0	0.0
O	RAPIOATA INC	2- 3	1 5/8	- 1/4	-13.5
O	REYNOLOS & REYNOLO	13- 21	15 1/4	- 3/4	-4.6
O	SCIENTIFIC COMPUTERS	1- 1	7/R	0	0.0
O	TYMSHARE INC	14- 28	16 1/2	+1 5/4	+11.8
A	URS SYSTEMS	3- 5	5 1/2	- 1/4	-6.6
N	WYLY CORP	1- 7	1 1/4	- 3/8	-23.0

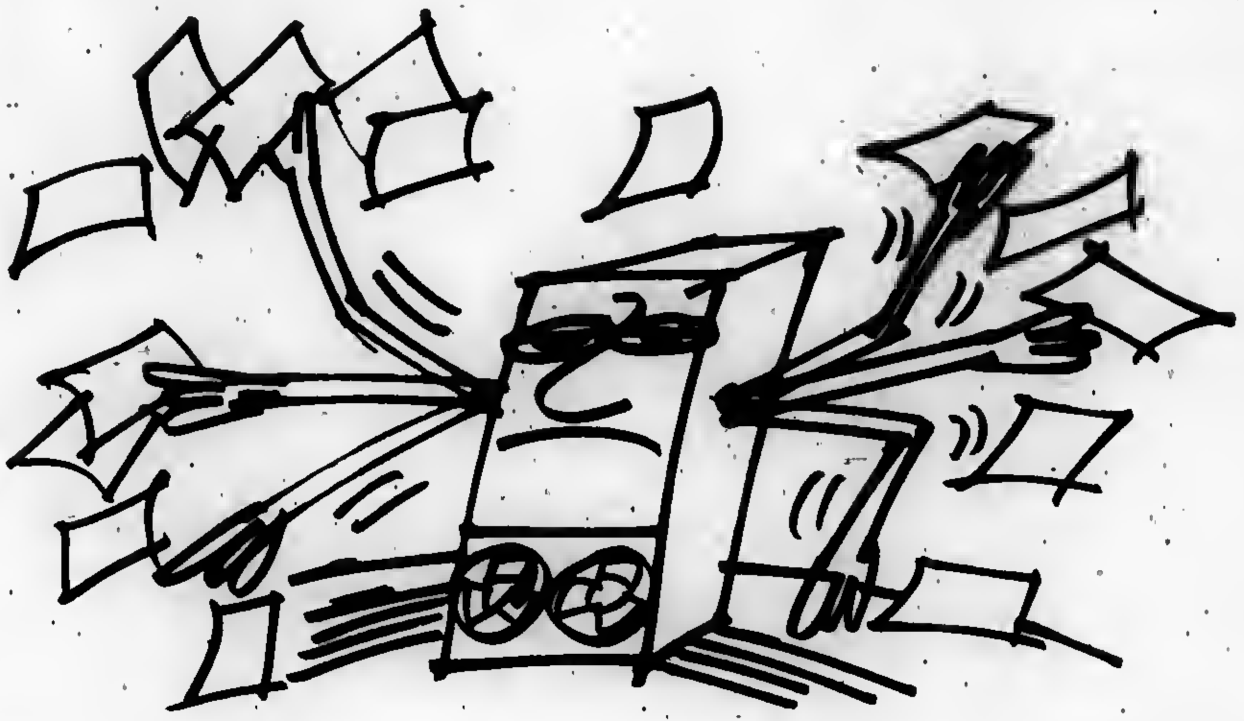
PERIPHERALS & SUBSYSTEMS

EXCH		1976 RANGE 111	CLOSE NOV 17 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	AOORESSOGRAPH-MULT	8- 15	11	+1	+10.0
O	AOYANCEO MEMORY SYS	4- 10	6 1/4	- 1/2	-7.4
N	AMPEX CORP	5- 10	6 1/4	+ 1/R	+2.0
O	ANOERSON JACOBSON	2- 4	5	+ 1/8	+4.3
O	APPLIED OIG OATA SYS	13- 23	16	- 1/2	-3.0
O	BEEHLYE MEOICAL ELEC	3- 9	8 3/R	+ 1/8	+1.5
A	BOLT, BERANEK & NEW	7- 11	7 7/8	+ 1/8	+1.6
N	BUNKER-RAMO	5- 10	7 1/8	+ 3/8	+5.5
A	CALCOMP	4- 7	4 3/4	+ 3/8	+8.5
O	CAMBRIOGE MEMORIES	0- 6	1/2	- 1/8	-20.0
N	CENTRONICS DATA COMP	20- 36	24 7/R	+1 5/8	+6.9
O	COOEX CORP	22- 42	28 1/2	+1 1/2	+3.5
O	COGNITRONICS	1- 1	1/2	0	0.0
O	COMPUTER COMMUN.	1- 6	4 7/8	+ 3/8	+8.5
O	COMPUTER CONSOLES	4- 7	4 1/4	+ 5/4	+21.4
A	COMPUTER EQUIPMENT	1- 3	1 7/8	+ 1/4	+15.5
O	COMPUTER TRANSCEIVER	1- 3	7/8	+ 1/8	+16.6
O	COMTEN	4- 9	7 1/8	+ 1/8	+1.7
N	CONRAC CORP	20- 25	21 1/2	+ 5/4	+3.6
O	OATA ACCESS SYSTEMS	1- 3	4 3/4	- 1/4	-3.0
O	OATA 100	6- 13	6 3/8	+ 3/8	+6.0
A	OATA PROOUCTS CORP	5- 13	11	+ 1/2	+4.7
O	OATA TECHNOLOGY	1- 2	1 1/2	+ 1/4	+20.0
O	OATUM INC	1- 2	3/8	- 1/8	-16.6
O	OECISION DATA COMPUT	1- 4	1 1/2	0	0.0
O	OELTA OATA SYSTEMS	1- 1	1/2	- 1/R	-20.0
N	ELECTRONIC M & M	1- 4	2 3/8	0	0.0
O	FABRI-TEK	1- 1	7/8	0	0.0
O	GENERAL COMPUTER SYS	0- 2	1/2	+ 1/R	+33.3
N	HAZELTINE CORP	4- 12	8 3/8	+ 5/8	+7.8
N	HARRIS CORP	34- 33	30 3/8	+ 3/8	+0.7
A	INCOTERM CORP	9- 20	11 3/8	+ 7/8	+8.3
O	INFOREX INC	3- 7	3 7/8	0	0.0
O	INFORMATION INTL INC	10- 18	12	+ 1/2	+4.3
O	INTEL CORP	47-109	48 1/2	+1 1/2	+3.1
A	LUNDY ELECTRONICS	3- 7	3 3/8	0	0.0
O	MSI OATA CORP	3- 7	6 1/4	- 1/4	-3.8
A	MILGO ELECTRONICS	13- 22	20 3/8	+ 1/8	+0.6
N	MOHAWK OATA SCI	3- 10	5 1/2	+ 1/8	+2.5
O	PENRIL CORP	1- 5	1 7/8	0	0.0
A	PERTEC CORP	3- 8	5 3/4	- 1/8	-2.1
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	3- 10	2	0	0.0
O	OUANTOR CORP	4- 6	4 578	+ 3/8	+13.6
O	RECOGNITION EQUIP	6- 11	8 5/8	+ 5/R	+8.0
N	SANOERS ASSOCIATES	6- 11	a	+ 5/8	+8.4
O	SCAN OATA	1- 4	1 1/4	0	0.0
O	STORAGE TECHNOLOGY	9- 13	10 5/8	+ 3/8	+6.2
O	T BAR INC	3- 10	3 1/2	- 1/8	-2.2
O	TALLY CORP.	4- 6	5 3/8	+1 3/8	+54.5
O	TEC INC	3- 7	6 1/2	0	0.0
N	TEKTRONIK INC	45- 69	60	+1 1/4	+2.1
N	TELEX	2- 5	2 1/4	0	0.0
O	WANGCO INC	11- 22	21 1/8	0	0.0
O	WILTEK INC	2- 2	1 3/8	0	0.0

SUPPLIES & ACCESSORIES

EXCH		1976 RANGE 111	CLOSE NOV 17 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	AOYANCEO SYSTEMS INC	1- 4	5 3/8	0	0.0
O	BALTIMORE BUS FORMS	3- 5	5 3/8	+ 1/8	+3.3
A	BARRY WRIGHT	6- 10	8 3/R	+ 5/R	+7.R
O	CYBERMATICS INC	0- 1	3/R	- 1/8	-23.0
A	OATA OOCUMENTS	25- 45	45 1/4	0	0.0
O	OUPLEX PROOUCTS INC	13- 24	12 5/4	0	0.0
N	ENNIS BUS. FORMS	6- 8	5 3/8	- 1/8	-2.1
O	GRAHAM MAGNETICS	8- 15	10 1/4	0	0.0
O	GRAPHIC CONTROLS	13- 19	16 1/4	+ 1/4	+1.5
N	3M COMPANY	33- 66	56 1/2	+1 1/4	+2.2
O	MOORE CORP LTO	52- 51	33 1/4	0	0.0
N	NASHUA CORP	11- 1R	15 5/4	+ 1/2	+5.2
O	STANOARO REGISTER	15- 19	17 1/4	0	0.0
O	TAB PRODUCTS CO	5- 11	8 5/4	0	0.0
N	UARCO	19- 25	19 3/8	- 1/4	-1.2
A	WABASH MAGNETICS	4- 9	9 1/4	+ 7/8	+10.4
N	WALLACE BUS FORMS	19- 23	22 1/8	- 3/8	-1.6

Does your IBM host computer do too much telecommunications housekeeping and not enough computing?



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COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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DEC Expands Its High End With Decsystem Offerings

By Esther Surden
Of the CW Staff

MARLBORO, Mass. – Digital Equipment Corp. has expanded its large-systems offerings upward with the introduction of a top-of-the-line Decsystem-20 and dual- and single-processor versions of a high-end Decsystem-10.

The medium-scale Decsystem-2050 is said to have double the performance of the Decsystem-2040 with a 25% increase in cost. It is in the performance range of the IBM 370/138 and 148, according to a spokesman.

The Decsystem-1090, which costs 10% to 20% less than its 1080 predecessor, is DEC's most powerful offering to date and can be compared to the IBM 370/148 and 158, according to DEC. The 1099 is the dual processor version of the 1090.

Designed for scientific, educational and engineering users, the 2050 features a cache memory not available on the 2040, DEC noted.

The 160-nsec cache gives the CPU an effective average access time of 244 nsec. Typically, data being written into or read from memory can be found in cache between 90% and 95% of the time, DEC claimed.

Available to 128 Users

The 2050 can accommodate up to 128 simultaneous time-sharing users while processing multistream batch requests, the firm said. Memory is expandable from 1.25M- to 2.5M bytes.

The system can accommodate up to 3.2G bytes of on-line disk storage using DEC's RP06 disk units, it added.

The Tops-20 operating system, developed for the 2040, has been enhanced for the 2050 to allow an increased number of jobs to be processed simultaneously, according to the spokesman.

As with the 2040, the 2050 features Computer Controller Operation using a PDP-11/40 minicomputer for system start-up and as a driver for card readers, line printers and interactive terminals, the spokesman stated.

Present 2040 users can upgrade to the 2050 in the field for $100,000 to $200,000, depending on the amount of main memory needed and the work necessary to install the cache and other enhancements, he said.

With the 2050, DEC announced Basic Plus-2, a Basic compiler which is said to be compatible with DEC's PDP-11

(Continued on Page 4)

CW Photo by A. Dooley

Trash or Treasure?

Shoppers rummage through bargains at the recent opening of Boston's Computer Warehouse Store. Outfits like this – "a cross between a scrap pile and world of dreams" – are spreading throughout the country to accommodate the growing number of computer hobbyists. See story on Page 2.

Management Called Poor

Medicaid Systems Hit for Deficiencies

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. – Deficiencies plague the automated federal and state Medicaid programs, investigators for the Senate Subcommittee on Investigations charged here recently.

These programs, which cost the Federal government nearly $1.5 billion annually, could well form the foundation on which the nation builds the claims-processing system for the proposed national health insurance program, according to staff investigators.

The Medicaid Management Information System (MMIS), developed and funded by the Department of Health, Education and Welfare (HEW) Office of Information Systems (OIS), suffers from management problems, according to a report prepared by investigators David Vienna and Walter S. Fialkewicz.

OIS is responsible for approving and funding state proposals for the design, development, installation and operations of MMIS implementations.

The Federal government provides 90% of the funds needed for system design, development and installation. Once a system is certified by HEW, a state can recoup 75% of the cost of operating that system.

Problems With Program

But there are problems with the program. The Senate investigators fear contracts for MMIS systems haven't been competitive enough, testimony indicated.

They view certification of a "fragmented" or multiple computer system used for the MMIS program in Texas, for example, as a dangerous precedent.

OIS itself is in need of a management system, the investigators said. The agency does not have the necessary financial data to manage the program properly, nor does it follow through to determine if states are using the data generated by the systems financed with "higher level" federal funds.

Noting the OIS filing system may indicate the broader management problems in the agency, the report said it "is so sloppy key documents are missing."

Furthermore, the agency does not keep track of overruns and system add-ons, which also receive 90% federal funding.

And, "though certification of developed systems carries with it 75% federal funding for the operation of such systems, OIS doesn't know exactly how much money this involves."

In addition, OIS "never verifies whether the sophisticated management information developed by the new systems is actually used by the states to spot fraud and abuse, identify problem areas of utilization and other key data elements required of such systems," Vienna and Fialkewicz reported.

California Health Department employees, for example, told the subcommittee staff the data produced by their certified MMIS is stacked on a table and not read, according to the report.

Competition in state contract awards for MMIS must be fair if federal funding is to be granted, but that is not always the case, the investigators pointed out.

Serious questions can be raised over a

(Continued on Page 6)

Packet Net Seen Best Option

By Stuart L. Mathison
Special to Computerworld

Faced with providing remote access to an interactive computer system, the data communications planner typically takes a look at the amount of usage expected from various remote locations and then compares the economics of building a leased private-line network vs. using conventional public circuit-switching facilities (i.e., the long distance telephone network).

Today the public packet network presents another alternative – one that not only compares favorably in cost, even for the largest users, but is technologically superior in many respects to a private-line network.

Compared with even the most sophisticated private line configuration, the public packet network comes out ahead in four major areas:

1. Its ability to adapt to changing and often unpredictable terminal communication requirements – new locations, increased traffic loads, new types of terminal equipment and new applications.
2. Higher quality service than is possible in the typical private-line network.
3. Reduced direct costs for communications as well as better utilization of the company's computer, terminal and staff

(Continued on Page 8)

CW Special Report on Data Communications Networks follows Page 34.

User Hands Over Tapes to IRS After Losing Appeals Court Fight

By John P. Hebert
Of the CW Staff

NEW YORK – In what appears to be the first case of its kind, a billion-dollar insurance holding concern headquartered here fought an Internal Revenue Service (IRS) demand for original computer tapes – and lost.

Continental Corp. handed over the 37 tapes to the IRS last week under orders from the Second Circuit Court of Appeals here, which reversed the 1975 opinion of a district court.

The tapes contained records of expenses and losses incurred from 1971 to 1972. If the company chose to retain copies of the tapes, it had to duplicate them "at its own risk and expense," the appeals court ruled.

Continental officials thought they had a case in 1973 when the IRS first requested the original tapes for audit purposes, according to Bill Gleason, tax counsel for the insurance company.

At that time, Continental turned over computer printouts made from the original tapes, explaining the hard copy it supplied the IRS was sufficient. Dissatisfied with the submission, the IRS sent a written request for the tapes in 1975, but the firm refused to comply.

Continental resisted the IRS summons for the tapes, Gleason said, on grounds that they are not "books and records," as specified by the government agency.

Computer tapes are just processing tools and nothing more, the corporation told the IRS at the time, Gleason recalled.

IRS Goes to Court

The IRS had different ideas. It brought the case to court in September 1975 and, in December, Judge Henry F. Werker of

(Continued on Page 6)

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THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
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Outfits Now Number About 78

Boston Store for Hobbyists Opens Doors

By Ann Dooley
Of the CW Staff

BOSTON – "A cross between a scrappile and a world of dreams." That's how one computer hobbyist described the Computer Warehouse Store that opened here this month.

Owned by American Used Computer Corp., the Computer Warehouse Store claims to be the largest in the country in size and amount of merchandise. Its stock includes a range of microcomputer kits built around Intel 8080, Motorola 6800 and Fairchild F-8 microchips.

The Computer Warehouse Store is only one of an estimated 78 such stores that have opened throughout the U.S. in the past year or so. The hobbyists they serve spent an estimated $15 million on equipment this year, according to Pertec Computer Corp.

Bill Grinker, one of American Used Computer Corp.'s owners, believes about 12,000 hobby computers are in use today.

The Byte Shop of Pasadena, Calif., opened on Sept. 9. It is one in a chain of approximately 30 such stores across the country.

"It took about $40,000 to $50,000 to get us started, but it can be done for less," according to Guruprem Sing Khalsa, the Pasadena store's general manager.

The most popular item sold is IMS Associates' Imsai 8080, Khalsa said. "We sell to a whole spectrum of people: professionals, hobbyists, novices and business people who are just realizing they can afford them now," he added.

CW Photo by A. Dooley

Dave Irvine lovingly clasps Recordak 1824 reader he won at the Computer Warehouse Store's hourly giveaway. He later admitted, "I can't think of anything to do with it."

The Computer Store in Pensacola, Fla., which opened in May, offers calculators ranging in price from $9 to $1,700 in addition to minicomputers.

"We soon discovered our name was bringing microcomputer and kit people into our store, and we're at present just getting into this area," sales manager Richard Roth said.

"We feel we may be the only store-type operation where an individual can see a demonstration of a $9 calculator, a $400 microcomputer or a $20,000 minicomputer when he walks in off the street," he added.

The Computer Workshop opened its doors in September, selling out of Betsy and Lawrence Chinnery's home in Rockville, Md. The store has since moved to a new location and is open only at night and on weekends because Lawrence Chinnery continues his job with a systems engineering company during the day.

"We are doing nicely and have just opened another store in Kansas City," Betsy Chinnery said. "We saw this field coming and we got into it."

The store carries the Southwest Technical Products, IMS Associates and Polymorphic Corp. lines.

In Ann Arbor, Mich., Compumart, Inc. set up shop last April to serve industrial, college and hobbyist needs, according to Jor Chin Ho, store manager, and David Rosche, president. An international mail order department is also operating successfully, Ho said.

"The most popular computer we have is [MOS Technology, Inc.'s] KIM-1, followed by the Imsai 8080," she said.

Ron Guberman's Media Reactions opened in March in Reston, Va., in the "shadow of the CIA."

The store is the tenth largest seller of computer hobby supplies in the country, Guberman claimed.

IMS Associates is the most popular vendor and Multiplex Communication, Inc.'s products also move very quickly, he said.

"We run the gamut of servicing DP professionals to those interested mainly in playing Star Trek," he said.

Clubs Spawned

The overwhelming interest in "computer hobbying" has also spawned a variety of computer hobby clubs. In McLean, Va., about 40 people – only one of whom has any strong connection with the DP industry – are members of the Chesapeake Computer Club.

Near Palo Alto, Calif., another group goes by the unlikely name of "The Homebrew Club."

And not far from Washington, D.C., an "in-house" club flourishes at Ft. George Meade in Maryland, the site of the National Security Agency, the U.S. Army Intelligence Agency and the First Army.

Most clubs have their own newsletters, but hobbyists interested in new products and feedback from others nationwide subscribe to a monthly newspaper devoted to their interest.

The newspaper is called *People's Computer Company* and is published in Menlo Park, Calif.

Five Men Sentenced for Altering Clients' Records at TRW Credit

LOS ANGELES – Five men convicted of conspiring to alter hundreds of credit records at TRW Credit Data and making false statements were sentenced last week in federal court here.

The five men were charged with working with an employee of TRW to alter computerized credit records of poor-risk clients [CW, Sept. 13]. Some of the companies victimized by this plot included Diner's Club, American Express, Master Charge, the Bank of America, Sears Roebuck and several leasing firms, the *Los Angeles Times* reported.

Philip Kostoff, the ringleader, was sentenced to 60 days in jail to be served on consecutive weekends, placed on five years' probation and fined $3,000.

The other four defendants – Paul Kostoff, Ronald Rossi, John R. Dubos and Kenneth L. Stevenson – were each sentenced to 40 days in jail, placed on five years' probation and fined $1,000.

A sixth man initially indicted in September, Sean Shanahan, was found guilty by the jury of conspiracy but acquitted of a false statement charge. Judge Manuel Real then acquitted him of both charges.

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Take the article called, "A guided bibliography to sorting," by H. Lorin, which appeared in the *IBM Systems Journal*.* It contains the best description we've ever seen of what it takes to make a top sorting team:

> "Developers of sort systems must be thoroughly familiar with the characteristics of the hardware of the sorting machine, they must be knowledgeable in program generation techniques, competent in program optimization and balancing methods, familiar with design technology and the operating system and I/O areas, as well as being competent sort specialists. In addition, since the performance of a sort is critical, a sort development team must be competent to undertake extensive prediction, analysis and test of their product's performance characteristics."

Why that's a perfect description of *our* people! That's what they do all the time — develop SyncSort, the best high-performance sort on the market today, and then test it against the competition. That is to say, IBM.

*Volume Ten, Number Three, 1971.

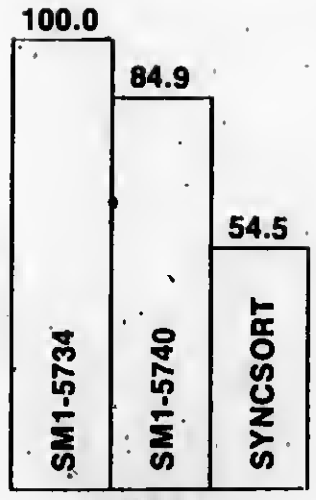
The last time this happened, we matched our SyncSort III-and-half against the Hardware Manufacturer's SM1-5734 and SM1-5740 (PEER/JCEMAN).

Frankly, the results weren't even close. IBM sent its own MF-1 moni[illegible]o evaluate the tests, and a human observer to make cer[illegible]at everything[illegible]ccording to Hoyle. But all to naught.

SyncSort performed better than the other two sorts in every category, as illustrated below:

OVERSEAS REPRESENTATIVES —

CAP-Gemini/CES, Brussels; CAP-Gemini GMBLL, Dusseldorf; CAP-SOGETI, Geneva; CAP-Gemini/Pandata, London; Syntax, Milano; CAP-Sogeti Prodvits, Paris; BRA, Stockholm; Advanced Technology, Tel Aviv; Shell Oil Co.of Australia, Melbourne; Deltacom Do Brasil, Sao Paulo.



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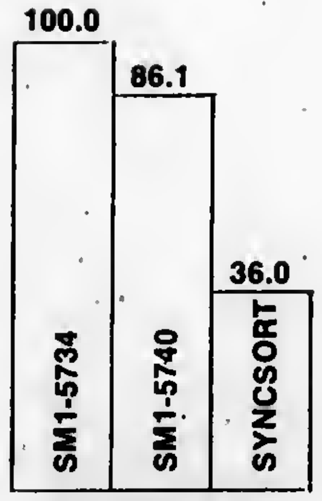
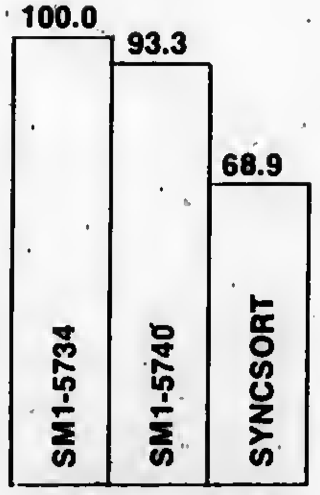
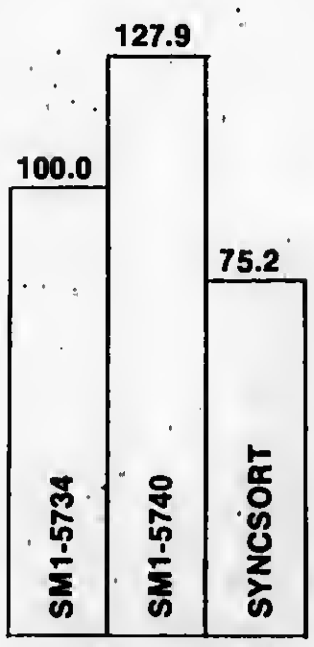


DISK KILOBYTE MINUTES



CHANNEL TIME



TOTAL CPU TIME

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We call 'em the four horsemen.

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Antitrust Case Unfolds on Coast; Drama Features Atypical Cast

By Molly Upton

Of the CW Staff

LOS ANGELES – The proceedings in Courtroom 8 here look like any ordinary trial, but the opening scenes in California Computer Products, Inc. (Calcomp) vs. IBM show it transcends the run-of-the-mill civil cases usually heard here.

For one thing, the antitrust case has a special judge, imported from Idaho for the proceedings. Some of the attorneys come from one of the most prestigious New York law firms; others come from a Los Angeles outfit that specializes in prosecuting antitrust suits against some of the largest corporations in the U.S.

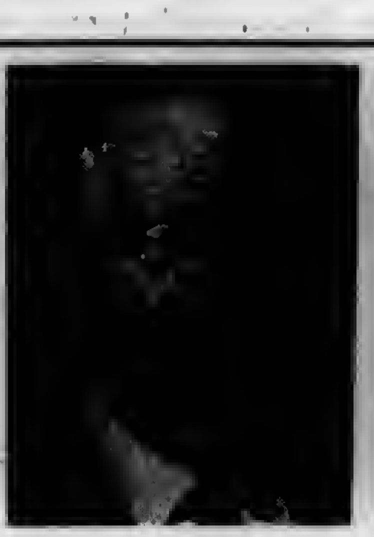
Even the court reporters – among the most important extras in a scenario like this – are special, coming not from the pool for this court but from an outside firm and chosen for their ability to speak and understand "computerese."

While Calcomp's lead attorney, Max Blecher, and David Boies, who heads the sizable IBM cast, appear eager to parry with each other when the curtain goes up on the main act in the trial, the opening scenes are adopted from the long-running, if boring, U.S. antitrust case against IBM.

The script to date has come from that off-off-off-Broadway production, with the parties and their associates entering testimony and depositions already heard in Courtroom 110 in New York.

Under the present arrangement, Blecher or an associate reads selected portions of the questions asked by the Justice Department; Boies' team then reads the appropriate cross-examination.

Boies


McNichols

CW Photos by M. Upton

Blecher

In inserting selected portions of the New York transcript into the record – a procedure to which the two parties had previously agreed – a Calcomp employee takes the witness stand, assuming the role of the executive being questioned.

At one point, however, Blecher seemed to fear Boies was upstaging him.

When Blecher realized Boies intended to insert as much material as possible from the New York case into Blecher's portion of the case, the Calcomp attorney objected. He accused Boies of trying to "obfuscate" his material with parts of the transcript that went beyond the bounds of his questioning.

On Blecher's second or third objection, Judge Ray McNichols told Boies to refrain and, if he wished, read the objectionable portions of the testimony during the IBM portion of the case.

Despite – or because of – an earth tremor measuring 3.8 on the Richter scale that was greeted with smiles and quizzical looks from several jury members, attorneys and spectators last Monday, Harold Collins, Blecher's partner, proceeded undisturbed in his questioning of the stand-in for Robert S. Oelman, former NCR chairman.

McNichols provides a great deal of what little diversion there is in the large, windowless air-conditioned courtroom – much to the relief of jury, spectators and attorneys.

DEC Adds Decsystems To Expand High End

(Continued from Page 1)

RSTS/E Basic Plus-2 language.

The top-of-the-line Decsystem-1090 introduced last week was designed for educational institutions, commercial organizations and industrial users, DEC said. It features a different processor from its 1080 predecessor.

Users of the 1080 can upgrade in the field to the 1090 for about $40,000, the spokesman said. No reprogramming or recompiling is necessary, he noted.

The 1090 CPU, called the KL10B, includes internal channels which replace external units that interfaced to the system's memory, he explained. All I/O transfers now go through the CPU, he said, adding up to eight channels can be accommodated within the processor.

With the enhanced processor, DEC announced a variety of subsystems to increase performance.

A memory subsystem called the MH10 allows main memory to be expanded from a minimum of 256K 36-bit words to a maximum of 4M words through the use of double-density technology, DEC said.

Also announced for the 1090, the DN87S communications subsystem combines asynchronous and synchronous communications in one front-end unit.

Previously, two separate units were needed for these functions.

Disk drives with capacities of 100M- and 200M bytes, which can be equated to IBM's 3330- and 3330-11-type moving head disks, were also announced for the 1090.

A basic Decsystem-2050, which will be available in January, costs $550,000 with 256K words of memory, 16 lines, 400M characters of disk, one tape drive and a line printer.

An entry-level 1090, available in March, includes 256K words of memory, 32 communications lines, and 500M characters of on-line storage and costs about $700,000.

A 1099 with 1M words of memory, several billion characters of on-line storage and 128 user lines costs about $2 million.

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User Loses Appeals Battle, Turns Over Tapes to IRS

(Continued from Page 1)

the District Court for the Southern District of New York ruled the IRS could have copies of the tapes, according to Gleason.

The court also decided that all costs of handing over the originals would have to be borne by the IRS.

Both parties in the case – U.S. and Walter Ross [IRS revenue agent] vs. Geoffrey Davey [Continental secretary] – appealed the circuit court rulings.

Late last September, the decision favoring the IRS on both counts was handed down by the Second Circuit Court of Appeals. In a nine-page decision, a three-judge panel gave the IRS access to "all relevant material" and not merely a form of that material for audit purposes.

In what appeared to be a statement of precedent for companies with computerized recordkeeping systems, the appeals court judges said:

"In this era of developing information storage technology, there is no conceivable reason to adopt a construction that would immunize companies with computer-based recordkeeping systems from IRS scrutiny.

"Such would not be in keeping with Congress' intention in enacting the section of the IRS code this case falls under."

The language in the IRS code, the court ruled, is sufficiently broad to cover data stored in the form of computer tape.

On the question of copies made from the original tapes, the judges decided the IRS "should not be required to rely on the taxpayer's affadavit that a printout accurately reproduces all information."

Countering Continental's argument of unnecessary inconvenience caused by relinquishing the original tapes, the court said "the taxpayer's suggestion that temporary removal of the original tapes by the IRS would unduly burden or unnecessarily interrupt the company's business is unsupported.

"On the contrary," the judges said, "Continental has had no real use for the tapes except as 'intermediate processing tools' for 30 days and it has retained them only to satisfy an IRS ruling that requires retention for auditing inspection" by the agency.

"In effect, the taxpayer argues that it may withhold the tapes from the very agency for which they are being retained because of the risk that [the IRS] may lose or destroy them. Such circular reasoning is unpersuasive," the court said.

On the question of bearing costs for duplication, the court stated, "For this billion-dollar company, which produces and stores some 200 tapes each year, the cost of duplicating the 37 tapes in question, estimated at approximately $1,305, would be minimal, representing but a small outlay in comparison with the other amount which the taxpayer expends annually in cooperating with the IRS."

Medicaid Systems Under Attack

(Continued from Page 1)

recent bid evaluation process in the State of Washington, for example, according to the report.

Last year that state sought bids on the development and implementation of an MMIS. Two companies were judged to be qualified bidders, but after the proposals were evaluated the contractor whose proposal was selected asked for $4.5 million more than his competitor.

HEW staff members objected and HEW officials asked the National Bureau of Standards for an opinion. The bureau affirmed the award of the contract to the higher bidder, but raised questions about the fairness of the evaluation process.

The second issue of concern to the subcommittee is HEW's approval and certification of multiple computer systems within one state, the report said. Such "fragmented" systems duplicate development and then operations costs, of which the government pays such a high percentage.

"Where fragmented systems are approved, there is a very serious question as to whether information generated by each system can be easily assembled into consistent and comprehensive reports" for management review, the report said.

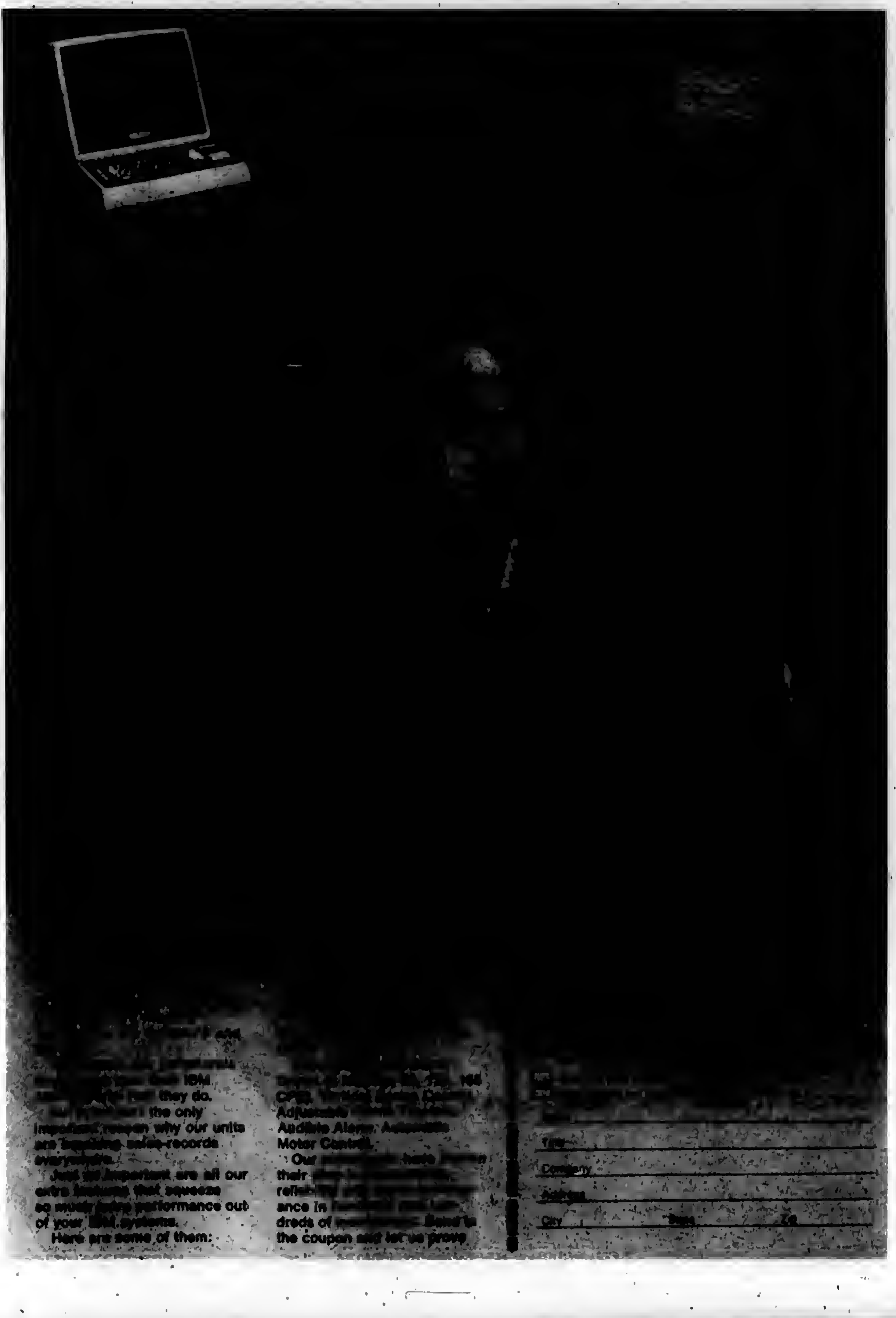
In addition, "the congressional intent behind the MMIS program clearly calls for numbers of states to join in the use of a single MMIS, so as to avoid duplications of development and operating costs," it stated.

"Any ratification of multiple systems within a state would appear to contradict the intention of Congress to consolidate numbers of states around one MMIS unit."

Yet in Texas HEW recently approved operation of a two-part automated Medicaid program: one is administered by Group Hospital Services, Inc., the Dallas-based Blue Cross plan for the state which pays for hospital and physician services to Medicaid beneficiaries on a prepaid, at-risk basis; the other is handled by the State of Texas, which manages the drug and nursing home elements of the state Medicaid program.

An audit of these systems for certification and consequent federal funding showed the contractors could not produce the reports required for federal review.

Despite this HEW audit last January, the HEW associate administrator heading the OIS, Harold Wienberg, sent a memo to the state certifying its systems.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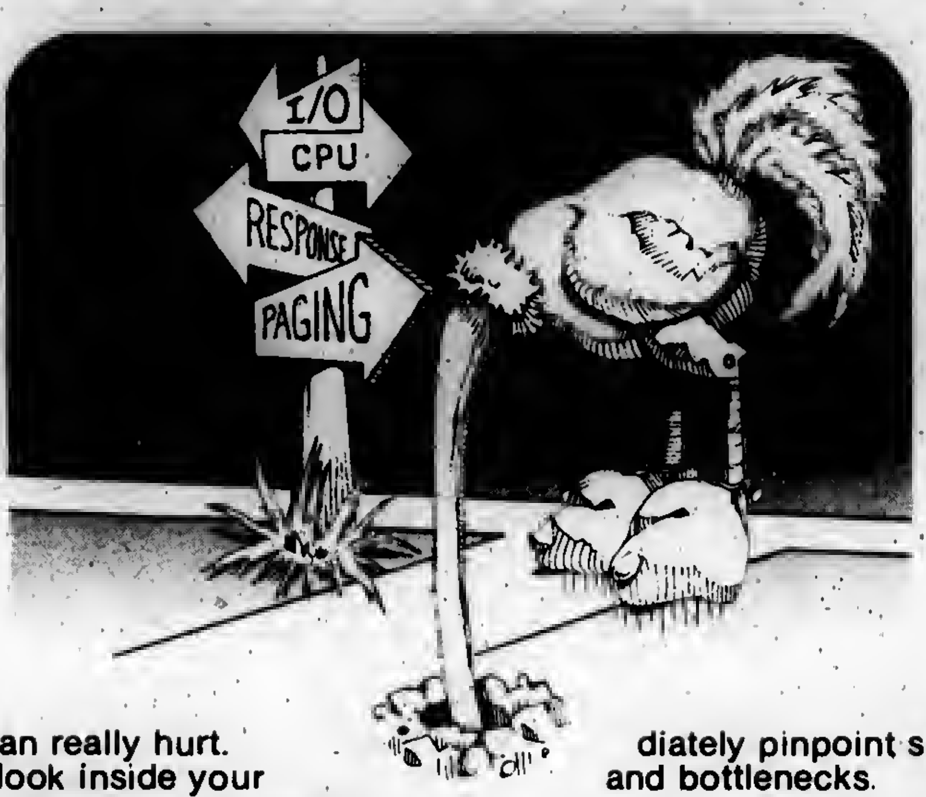

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Public Packet Network Seen Best Alternative for User

(Continued from Page 1)

resources.

4. Elimination of many of the housekeeping chores associated with network management, such as sizing the network and selecting equipment, dealing with multiple vendors, maintaining the system and monitoring network utilization and performance.

With a leased private-line network, a user must install facilities in each remote location appropriate for the anticipated traffic load.

Since the utilization of interactive systems is somewhat difficult to predict, privately installed facilities are often mismatched to the requirements – having either too many or too few access ports in a remote location.

In contrast, for a computer on a public packet network the problem of having too much or not enough port capacity is eliminated. Peak traffic loads can be handled easily.

And, in terms of geographic availability, adding terminals in new locations requires no effort at all on the user's part.

Packet switching's greatest advantage is its flexibility. Typical private networks offer access to only one computer system or computer center (when a company may operate multiple systems at multiple centers), but the public packet network permits any terminal to access any computer system on the network.

Terminal user authentication is ordinarily performed by the customer computer system, although public packet networks also offer mechanisms for limiting access to specified network ports.

Additionally, the public packet network handles a wide range of terminal types and provides many options to the user on how each terminal type is to be handled. The user may specify parameters which determine the response time performance of the network; half- or full-duplex transmission; local character echoing by the network or remote echoing by the customer computer; the amount, if any, of padding to be inserted by the network; and whether the network should code convert characters into a standard form.

Some of the parameters are established when the customer's computer is initially connected to the network. Other parameters may be dynamically controlled by the customer's computer or, in some cases, by the terminal user.

Quality of Service

In terms of availability of service, public packet networks offer higher availability than all but the most costly and sophisticated private networks.

First, the probability a terminal user will encounter a busy signal when dialing into an access port during the peak hour is appreciably higher in the case of the private network with few ports in each city than in the case of the public packet network with many ports in each city.

Second, when a line, multiplexer or concentrator failure in a private network can put all terminal users in a city out of business, similar equipment or line failures within a public packet network are invisible in most cases to the user.

The packet net is a highly interconnected distributed network with many computers at each major switching node.

Since user data is broken up into small segments, called packets, and dynamically routed along the best path at any given moment, a link outage in the backbone network is invisible to the user.

Moreover, each major switching center is equipped with one or more "hot standby" processors, which automatically take over should an active processor fail.

Finally, public packet networks utilize powerful error detection and correction techniques, reducing errors.

Economy Factors

One of the basic appeals of a public packet network is the ability to have a nationwide communications network with virtually no investment. The time delay and the capital investment required to build and maintain a private network are largely eliminated.

For the Telenet Communications Corp. public packet net, for example, the monthly fixed costs to link a customer computer to the network consist of a flat rate for the leased channel port at a Telenet central office and for the access channel.

From here on, a customer has two options. The company can dial in to public access ports and pay for such ports by the minute.

Alternatively, private dial and leased channel ports for terminal users can be ordered at a fixed monthly rate.

If the choice is public dial-in facilities, the hourly charge will range from $1.40 to $4.80 per hour depending on the rate classification of each city. However, in cities where a company has many terminal users and high traffic volume, the network offers a sliding rate structure which brings the dial access charge down to 70 cents per hour.

These rates are substantially below long distance telephone or Wats charges and also compare very favorably to the hourly costs of typical multiplexer or concentrator network configurations.

It should be noted that when a terminal user dials into a local network access point and establishes a connection to a remote computer, the charges for such access are billed to the host computer.

While direct reduction in communications expenditures represents major savings, computer users also realize substantial additional savings resulting from the "network management function" performed by the public packet-switching network organization.

The design, implementation, operation and maintenance of a nationwide private data communications network requires a considerable amount of company resources.

It is necessary to forecast uncertain traffic volume; recruit data communications specialists; consider various network design alternatives (e.g., multiplexers or programmable concentrators); evaluate different types of modems, multiplexers and minicomputers; and incur capital investment costs for equipment.

Network management costs for such tasks are sometimes as large as the direct costs for network line facilities. Since the operator of a public packet-switching network performs these functions on behalf of the user, companies may realize additional savings.

Mathison is vice-president of Telenet Communications Corp. in Washington, D.C.

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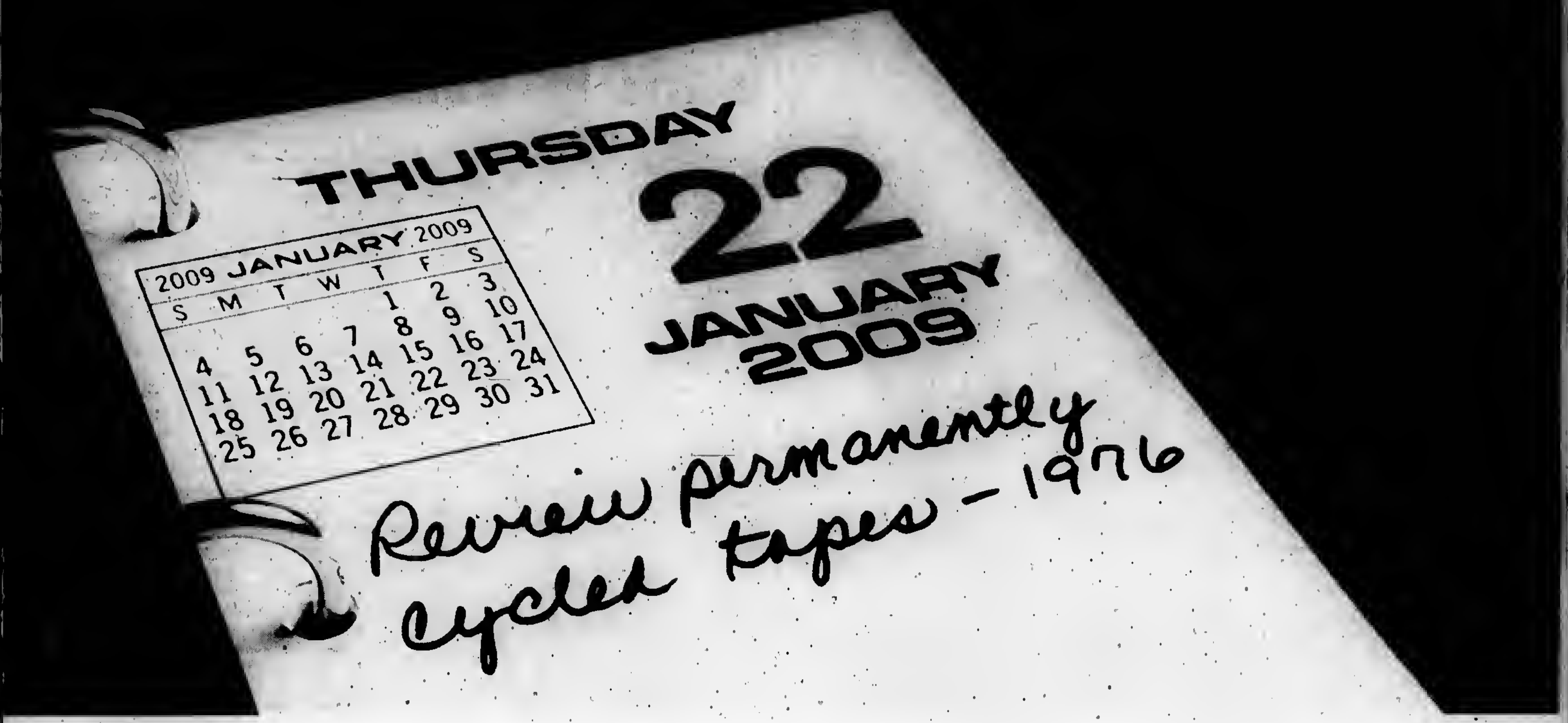

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Number of DPers 'Significant' In Five UK White-Collar Unions

By a CW Staff Writer

ALEXANDRIA, Va. – Five white-collar unions in the UK already have "significant" DP memberships, Barry A. Wyld, a professor at Northern Ireland Polytechnic, said here recently.

They are the Association of Professional Executive, Clerical and Computer Staff (Apex), the Association of Scientific Technical and Managerial Staff (ASTMS), the National Association of Local Government Officials (Nalgo), the Union of Electrical Workers/Technical and Supervisory Staff (Tass) and the Society of Civil Servants (SCS).

Apex is very active in recruiting DP people working in data preparation, Wyld said. Of its total 1975 membership of 140,000, 10,000 were in DP and Apex planned to make DP one of its major growth areas in its 1976 recruitment campaign.

With 50 full-time employees backed by a team of highly qualified research specialists, Apex sponsors 16 members of Parliament, Wyld stated.

ASTMS Militant

ASTMS boasts that "wherever there is a major computer installation handling data/information in a company, apart from the civil service, you will find ASTMS members," according to Wyld.

"We organize service engineers for all [UK] manufacturers – except, of course, IBM," ASTMS leaders have also said, and Wyld believes "they are working on that small problem."

With 14% of its 310,000 members in DP in 1975, ASTMS "is militant and aggressive and uses strikes to get what it wants," Wyld said.

The complete public sector is Nalgo's area of concern, and it has half a million members, of which 20,000 are in DP.

"This union has employed strike tactics where it has called out nonaffected operations staff as a lever to settle other members' claims," Wyld stated.

For example, Nalgo effectively closed down the gas industry in the UK for several days, and computer people were used as a lever to settle the dispute although it had nothing to do with computers, he said.

When Nalgo pulled out these DP members in sympathy with other workers, the dispute was settled within 84 hours, he noted.

Tass uses an approach much like that of ASTMS, Wyld said, noting approximately 10,000 DP workers were among its 114,094 members in 1975.

Valuing the strike method as a means of furthering members' interests when negotiations fail, Tass "is fully aware many of its members are employed in jobs where the withdrawal of their labor can be highly disruptive," he added.

As for the civil servants' organization, SCS, Wyld said the organization maintains a low profile and engages in one-day token strikes. The central government is Britain's largest computer user and the largest employer of computer staff, he pointed out, adding a conservative estimate shows about 7,000 of the government's DP employees are SCS members.

Noting that industrial disputes involving computer installations and companies were never mentioned in the press three years ago, Wyld said today it is rare for one week to pass without mention of an action taken by white-collar unions.

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To Increase Guilds' Power

UK Unions Pursuing DPers

By Edith Holmes
Of the CW Staff

ALEXANDRIA, Va. – The white-collar unions in the United Kingdom see the whole DP field as "ripe for picking," Barry A. Wyld, a professor at Northern Ireland Polytechnic, said here recently.

Not too long ago "the computer professional stood aloof from the usual framework of management and the trade unions," Wyld said. "Very few installations were unionized."

But now things are changing. White-collar unions are increasingly attractive to DP personnel in the UK, yet management appears totally unprepared for what lies ahead, he stated.

By controlling dissatisfied data preparation people – by far the largest group of DP workers in the UK – the unions have the power to disrupt an organization or even a whole industry, Wyld said.

Similar chaos can result from union control over much smaller and more highly skilled groups such as service engineers, he added.

Unlike UK management, the white-collar unions "are fully aware of the value of these workers as a key which can be used effectively in the settlement of a wide range of disputes," Wyld said.

"Furthermore, if the unions are to retain their political strength, then they must become more aggressive in courting the white-collar workers," he noted.

The function of the British trade union today remains what it was in the 19th Century: the protection of workers' interests, Wyld explained. Because they sponsor members of Parliament, the unions can wield substantial political power as well. Trade unions in the UK can have a considerable effect on the economy, he noted.

As of this year, the total DP work force of between 190,000 and 200,000 in the UK is spread over more than 40,000 installations, he estimated. The total membership of this group in white-collar unions is approximately 77,000.

Like other white-collar workers, DP people have "played an increasingly important role in the economic life of our nation," Wyld said. At the same time, however, "they have become worth less relative to manual and blue-collar workers."

The preferred terms of employment that once belonged to white-collar workers alone are now shared by the total work force, he noted.

Pro-Union Factors

Two factors – office specialization and the use of computers – have contributed to the many workers' feelings of not being able to get ahead, which in turn leads to a pro-union attitude, Wyld maintained.

Office specialization has reduced the level of skill required and increased the number of dead-end jobs, he explained. "The introduction of capital-intensive computers has facilitated an assembly approach to work, demanding shiftworking."

In particular, programming "has become deskilled to such an extent that it may be described as a routine clerical function," he said, predicting this job function will disappear in the next 10 to 15 years.

Shiftworking is already the accepted procedure on the operations side of an installation, he added, and more complex operating systems have resulted in a faster work rate, requiring greater attention to detail.

"Data preparation is already the accepted subject of work study investigation," Wyld said.

For the systems analyst, the problem is "promotion blockage," he continued. The analyst finds it difficult to break into DP management and therefore does not see much of a career path ahead of him.

All of these factors contribute to trade growth, Wyld said: Dissatisfaction in the UK DP community also coincides with a decline in the total number of manual workers and a rapid increase in the number of white-collar workers.

"If the trade unions want to maintain their relative position in the power structure of the country and play an effective role, then they will have to continue their pressure on recruiting white-collar workers," Wyld contended.

DP people are an important target for union membership not only because their presence contributes to the overall strength of the union, but also because they can be used as bargaining levers, he said.

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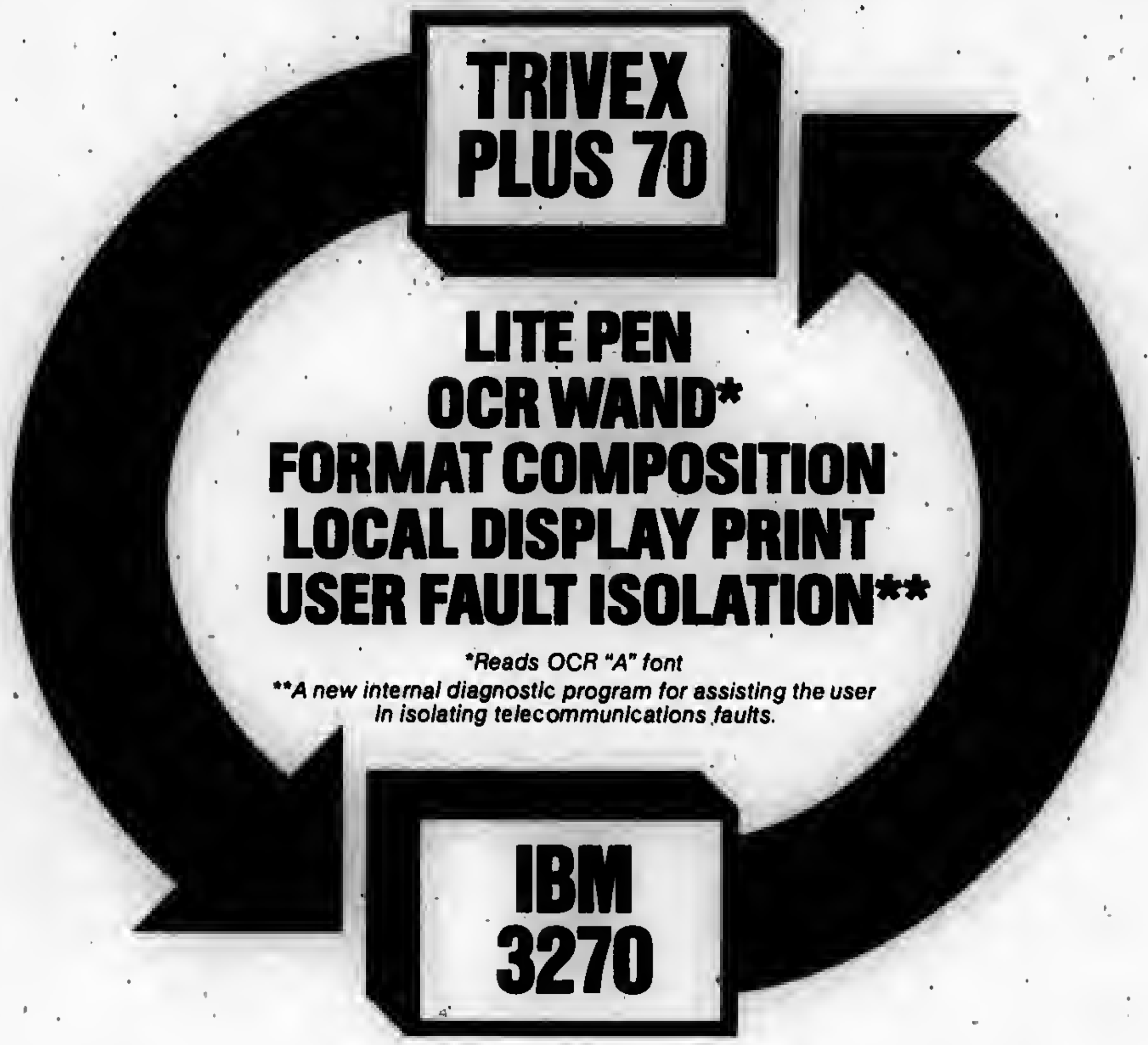

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STOCKHOLM – About 60% of Sweden's eight million people share only 150 surnames, which makes searching through a telephone book to find any one of the 380,000 Johanssons, 370,000 Anderssons, 239,000 Nilssons or 209,000 Karlssons a nerve-wracking experience at best.

The Swedish government is attempting to solve this problem with the help of a computer. The system is being used to compose and publish books of new names which Swedes may choose to adopt as their own.

Combinations Created

Existing Swedish words and local and regional place names stored in a data base are generated into all possible combinations resulting in names like "Hokflod," which translates to "wild bird river."

Although the Swedish government has been offering new names for the past 30 years, the computer was brought in only recently.

About 5,000 Swedes apply for new names each year. Total processing costs for a name change are reported to be about $50.

Privacy Commission Sets Public Hearings

WASHINGTON, D.C. – The Privacy Protection Study Commission will hold public hearings on employment and personnel record-keeping practices here on Dec. 9-10 and Dec. 16-17.

Hearings will begin at 9:30 a.m. each day in Room 2318 of the Rayburn House Office Building.

The hearings are part of the commission's inquiry into the desirability of extending the principles and requirements of the Privacy Act of 1974 to the private sector and state and local governments.

Under scrutiny will be the employment and personnel recordkeeping practices of private industry, state and local governments, private nonprofit organizations, employment agencies, consumer investigative companies, private investigating agencies and labor unions.

Additional information on the hearings is available from the commission at 2120 L Street N.W., Washington, D.C. 20506.

EFT Commission to Address Issue of Sharing Systems

WASHINGTON, D.C. – The National Commission on Electronic Fund Transfers (EFT) will hold hearings on issues impacting the sharing of EFT systems on Dec. 9-10, in Room 2128 of the Rayburn House Office Building here.

Witnesses will be asked why EFT systems should be shared; what the impact on consumers would be if sharing were prohibited, permitted or mandated; which institutions and organizations should be required to share; and who should legislate sharing.

Further information is available from the commission at 1000 Connecticut Ave. N.W., Washington, D.C. 20036.

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201C	SLD	462	1,512/yr	25
208A	SLD	1,706	2,796/yr	16
209A	SLD	4,316	5,676/yr	10
301 (19.2)**	SLD	8,564	10,164/yr	10

*An average of the savings in Boston, New Jersey, Michigan, and Wash. D.C.
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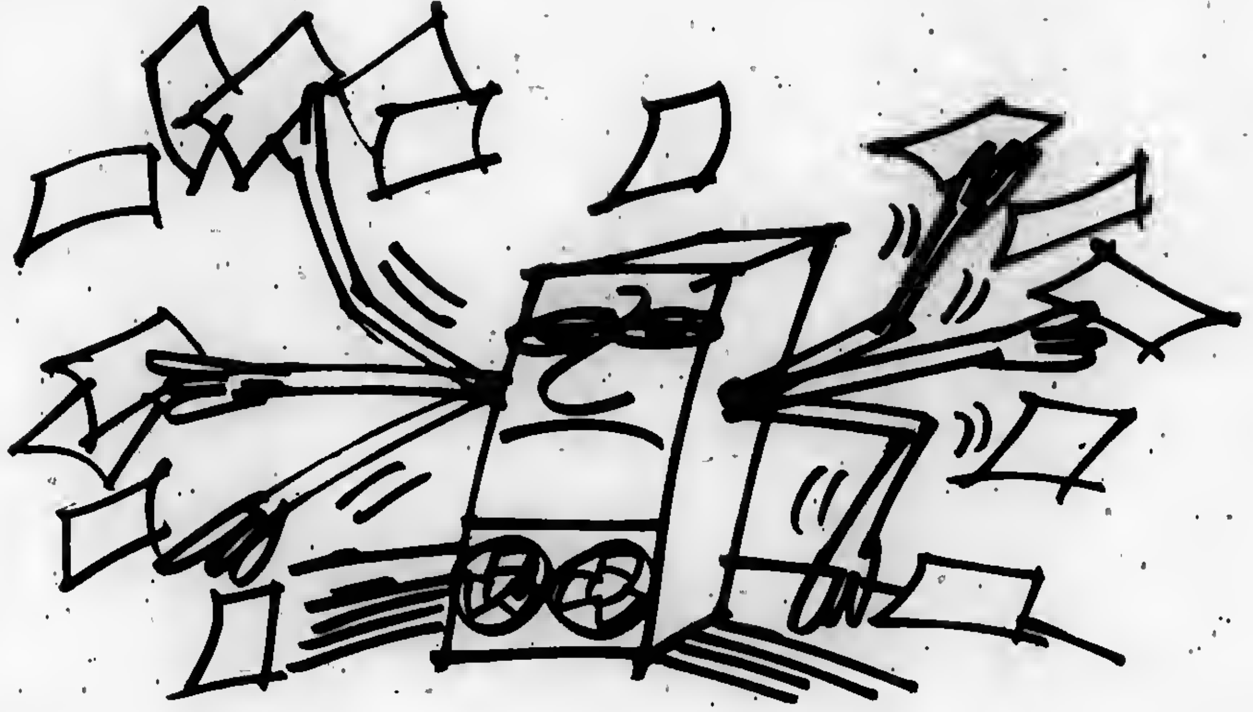

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Calendar

Nov. 29-Dec.1, NEW YORK – '76 Input/Output Systems Seminar. Contact: Input/Output Systems Association, P.O. Box 1333, Stamford, Conn. 06904.

Dec. 2-3, Washington, D.C. – Formatted File Systems Commercial Users Group 1976 Meeting. Contact: Carolyn Shamlin, 1860 Lincoln St., Suite 700, Denver, Colo. 80203.

Dec. 6-7, Washington, D.C. – Life Cycle Costs and Logistics Alternatives, sponsored by the American Institute of Aeronautics and Astronautics. Contact: Helen Flourny, 444 W. Ocean Blvd., Suite 1403, P.O. Box 1710, Long Beach, Calif. 90801.

Dec. 6-8, San Francisco – Computer Software Conference, sponsored by the American Institute of Industrial Engineers (AIIE). Contact: Diane Summers, AIIE, Computer and Information Systems Division, P.O. Box 3727, Santa Monica, Calif. 90403.

Dec. 6-9, Las Vegas – Fall Digital Equipment Computer Users Society (Decus) Meeting. Contact: David Simler, Decus, Maynard, Mass. 01754.

Dec. 7-8, Washington, D.C. – 1976 Transportation Data Coordinating Committee (TDC) National Transportation Systems Forum and Exhibit. Contact: TDCC, 1101 17th St. N.W., Suite 309, Washington, D.C. 20036.

Dec. 7-10, Chicago – Distributed Data Processing Conference, sponsored by the American Institute of Industrial Engineers.

Dec. 7-15, Moscow – Sovexpo '77, sponsored by Clapp & Poliak, Inc. Contact: Clapp & Poliak, Inc., 245 Park Ave., New York, N.Y. 10017.

Dec. 8-10, Orlando, Fla. – College and University Systems Exchange (Cause) National Conference. Contact: Cause, 737 29th St., Boulder, Colo. 80303.

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NCC to Focus on Personal Computing

MONTVALE, N.J. – A major program on computing will be featured as part of the 1977 National Computer Conference (NCC) to be held in Dallas on June 13-16, according to an American Federation of Information Processing Societies (Afips) spokeswoman.

A personal computing fair will feature exhibits of individually-owned projects that will be judged in several areas such as hardware, software and applications.

For information on participating in the fair, contact Harold A. Mauch, Percom Data Co., 4021 Windsor, Garland, Texas 75042.

Societies/ User Groups

Papers and proposals for two days of panel sessions are currently being solicited on personal computing software, hardware designs, trends for personal computing, influence of the personal computing movement on the computer industry and on computer science education, innovative applications of personal computing systems, standards for personal computing products and forecasting of trends in personal computing.

Deadline for all submissions is Dec. 1, 1976. For a copy of the official "call for papers" and "paper guidelines," contact Dr. Robert R. Korfhage, '77 NCC Program Chairman, Department of Computer Science, Southern Methodist University, Dallas, Texas 75275.

A personal computing club congress will allow representatives of clubs to exchange ideas relating to club activities and problems, the spokeswoman indicated.

Information on exhibit space may be obtained by contacting Carol Sturgeon, manager of conference operations, Afips, 210 Summit Ave., Montvale, N.J. 07645.

AEDS Annual Programming Contest Set for Students in Grades 7-12

WASHINGTON, D.C. – The Association for Educational Data Systems (AEDS) will hold its 14th annual computer programming contest for students in grades 7-12.

Entries are welcome in the following categories: business, biological and physical sciences, computer art, computer science, games, humanities and mathematics. Deadline for entries is March 1, 1977.

The grand prize is a $100 U.S. Savings Bond plus a minimum $300 travel grant to attend the 1977 AEDS Convention in Fort Worth, Texas on April 25-29.

The winning student's sponsor also will receive an all-expense paid trip to the convention.

Category winners will receive a $50 U.S. savings bond.

Team as well as individual entries may be submitted, but in the event a team wins, only one member may travel expenses-paid to the conference.

For additional information, contact E. Keith Smelser, 5040 Bald Eagle Ave., White Bear Lake, Minn. 55110.

SIC/EFT Slates Panel Discussion

NEW YORK – A panel of five bankers will give a presentation on the functions and services of the New York Automated Clearing House on Dec. 9.

The program, which is sponsored by the Special Interest Committee on Electronic Funds Transfer (SIC/EFT), will begin at 5:30 p.m. at the Hotel Lexington here.

The panel will be chaired by George C. White Jr., vice-president, The Chase Manhattan Bank, and participants will include James O. Aston, assistant vice-president, Federal Reserve Bank of New York; Charles W. Donaldson, vice-president, Manufacturers Hanover Trust Co.; Santo E. Galdi, vice-president, United Jersey Bank; and Alexander V.R. Halsey, senior vice-president, Morgan Guaranty Trust Co.

For details, contact Bob Duffy at the New York City Chapter, P.O. Box 245, New York, N.Y. 10017.

Singer Users Selected For Leadership Posts

HARTFORD, Conn. – Milford Munson was selected vice-president and Shirley Dyess was elected to the Board of Governors of Forum International, the Singer Information Systems users group.

The announcement was made at a meeting of the Board of Governors at the association's fall conference here recently.

Munson is data base administrator for the Materials Fabrication Division of Lawrence Livermore Laboratory.

Dyess is DP manager for Sue Ann, Inc. in Dallas.

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For complete details on the BASF "Winchester" Data Module, write: BASF Systems, Crosby Drive, Bedford, MA 01730, or call our nearest regional office: in Los Angeles, (213) 451-8781; in Dallas, (214) 233-6607; in Chicago, (312) 343-6618; in Clifton, N.J., (201) 546-9111; in Montreal, (514) 341-5411; and in Toronto, (416) 677-1280.

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Micros Heralded as Way of Future

Mainframes, Minis Seen DP's Endangered Species

By Edith Holmes
Of the CW Staff

ALEXANDRIA, Va. – The massive central computer "is a woolly mammoth whose time has passed" and minis as we know them today are doomed, according to Dan M. Bowers, technical editor of *Mini-Micro Systems*.

Micros will grow upward to become the basis of all product lines, Bowers predicted at a recent conference panel discussion here.

Lt. Cmdr. James F. Howick, chief of the U.S. Naval Operations' Information Systems Division, agreed.

Borrowing an analogy from Cmdr. Grace Hopper, Howick said "if we compare computing to the aircraft industry, then we are at about the Ford Trimotor level of technology.

"Micros are the jets in this industry, and they're coming," he added.

Beast Not Dead

But the third panelist, Jack T. Lynch, director of advanced development for Burroughs Corp., argued the woolly beast isn't dead yet.

Large mainframes, traditionally used to manage data bases of increasing size, will continue to do so while the industry learns to partition data bases into pieces that processors on a chip can handle, he said.

In addition, large problems requiring considerable number crunching will still exist, Lynch stated. Weather prediction, plasma studies and wind tunnel or airplane test emulations will still need big computers to produce results in a short period of time.

Lynch acknowledged the development of micros and minis presents an interesting problem for the company whose job is to sell large mainframes. Ultimately, he agreed with Bowers and Howick that micros are the way of the future and will come about as fast as manufacturers can put increasing amounts of memory on a chip.

Word-processing and integrated systems that combine computer and communications technologies are two areas Lynch secs open to companies like IBM and AT&T, in addition to Burroughs. The opening of these areas, coupled with the time it will take for the micro to fully develop, means there is a future for large mainframes, he suggested.

In the mini- and micro-dominated future, however, Bowers predicted there will be "a shakeout of computer manufacturers." Those that survive will be a combination of the present minicomputer manufacturers and the semiconductor makers, he said.

Both Bowers and Howick agreed these events won't take place overnight. Howick pointed to one "disappointing aspect" of micros – the minimum software and support that comes with them.

A lack of standardized software is one reason why micros can't compete with minis and maxis today, he said.

The profits the semiconductor manufacturer now makes from selling chips in quantities could be reduced as greater capabilities find their way onto single chips, Bowers added, noting lower profits could mean limited development of micros.

While Bowers looked at the growth of minis and micros as the way to bring computer power as many as four times closer to the user, Howick viewed the advent of such machines as a means to automate applications previously too expensive or too risky to put on a computer.

Distributed minis and the coming of micros promise service to the user, an ability to solve a wider range of problems with a smaller amount of programming skill and manageable system elements that will make problems easier to correct, Bowers said.

In addition, he noted, users will be able to make a better match between computer power and the applications to be performed.

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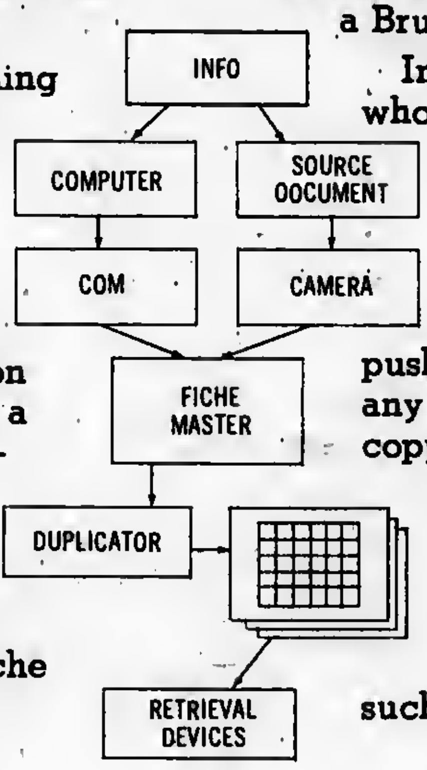

Clear Writing Called Path to System Optimization

By Don Leavitt
Of the CW Staff

CINCINNATI – Improving the technical writing that surrounds any proposed or actual DP system is likely to be one of the best ways to improve the system itself because everyone concerned will have a clearer understanding of what is to be done when, how and by whom.

While that may seem obvious, it may also be one of the hardest improvements to develop, according to Linda Hinke of Cincom Systems, Inc.'s Federal Division.

Bad writing habits are hard to break, she told a session at the vendor's user meeting held here recently, but there are ways of doing it.

First of all, no matter what the purpose of the writing, the writer should consider the reader, she said.

"Watch out for peopleless writing," she warned, adding that personal references in conjunction with things to be done "are perfectly all right – and certainly better than impersonal, passive constructions to which no one can relate."

The Human Connection

Even when the reader is taken into account, a lot of technical writing suffers from wordiness, Hinke continued. Sheer volumes of words can overwhelm the person it is supposed to help and defeat whatever purpose the writing originally had.

Finally, she said, even if the writing considers the reader and is of reasonable size, it can lose its value if it is poorly planned or filled with ambiguous or needless words.

To illustrate the need to recognize the reader, Hinke set up an experiment, asking each member of the audience to write down a description of a diagram she distributed.

At the end of the writing time, she explained two different diagrams had been passed out. Then she asked half the audience to draw the diagrams of the other half – based solely on the written descriptions provided by the other participants.

Although some of the new drawings were close to the originals, most were not because, as Hinke noted, the written descriptions were not complete. They often omitted vital points obvious to the writer since the diagram was right there, but completely unavailable to the person attempting to work from the narrative description.

'Cool It'

In a more serious vein, Hinke urged attendees to plan whatever writing they had to do, do the writing and then "cool it" for a while – "put it aside for an hour, a day or a week or more" – before revising it or passing it along.

The planning phase involves organizing and outlining what is to be covered in the writing, she said. The organization would vary depending on the subject: Recounting a chain of events would lend itself to a time-order sequence, she explained, whereas describing a multicenter DP operation might be easier following a spatial or place order.

There are valid reasons for ordering things in either increasing or decreasing importance, but in any case an outline is "almost indispensible" to doing a good job, she said.

By starting with an outline, she went on, the writer has a much easier time revising the writing altogether or changing the sequence of items without changing everything.

"You can be sure the important parts are where you feel they should be, or you can put them in the right place after all," she added.

The review after the writing and the cooling-off period should be quite organized, Hinke said. Writers should check first to see all the pertinent information – and nothing extraneous – is there, then see if the writing is clear, she added.

After that, the writer should be concerned about grammar, spelling, construction and verb tenses – "but those niceties won't mean much if the needed information isn't there first."

Checking to see if the number of words can be reduced and if the writing style can be changed should wrap up the review process, Hinke said.

Moving to the subject of ambiguous and needless words, Hinke distributed handouts describing eight types of problems and a number of suggested ways around them. The list of problems ranged from "fog words" – technically accurate but verbose and often overused – through tautology into what Hinke called "dilute verbs" and "hiccups" – the use of unnecessary prepositions and adverbs.

Roundabout constructions, false elegance and pointless words and phrases were also condemned by Hinke, who ended her presentation with a list of good "action verbs" she urged her audience to use in place of the "heavy" multisyllable verbs that have taken over so much technical writing today.

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Editorial

Washington Simmering, Bell Cooking

With the introduction of its latest data communications devices, AT&T has served notice that it intends to be a vigorous competitor. At the same time, however, the products raise some new questions for users.

The Bell 212A data set is a two-wire, full-duplex unit that follows the technology pioneered by Vadic Corp. in 1974 and also introduced earlier this year by Universal Data Systems. But the 212A uses different technical standards and is therefore not compatible with either of the two independent modems.

This situation is not unique, of course, especially in the higher speed modem arena where differing modulation schemes often make various vendors' data sets incompatible with each other.

There are some unique precedents in this low-speed area, however. Full-duplex 1,200 bit/sec data transmission was developed by non-Bell vendors. Bell carefully evaluated the Vadic modem in its Purchased Products Division offering vague promises to Vadic that the device might be adopted by Bell companies.

In the end, Bell Labs developed a different modem which AT&T spokesmen say was designed specifically to be compatible with earlier Bell System 100 series data sets.

It would be much easier for users if there were compatibility among these modems so the 212A could be connected into a network already operating with Vadic VA 3400 modems. Instead, users will have to choose which unit best meets their needs.

There is no reason technical differences must exist which preclude equipment compatibility. Each supplier claims to have a superior product and it will be up to the marketplace to sift out the better features.

Meanwhile, the desires of the user go virtually unnoticed, except for the fact the customer has one more major supplier from which to choose.

In the same vein, the AT&T 43 Teleprinter puts the Bell System squarely into the portable terminal area. AT&T has chosen the plug-and-jack arrangement standardized by the Federal Communications Commission (FCC) to connect this new unit. On the surface, AT&T spokesmen say they are simply complying with the new certification/registration program.

Bell has now used the plug-and-jack program — designed to simplify interconnection for its competitors — as a vehicle to enter the portable terminal market. That may not be quite what the FCC had in mind, but it demonstrates the aggressive manner in which AT&T intends to compete in the future.

This teleprinter shows Bell will not sit back while its legislative proposals simmer on the Washington back burner. It still has many equipment options it can exploit.

AT&T, Bell Labs and Western Electric are a tremendously powerful monopoly combination operating under the protection of the regulatory umbrella. This is one of the important competitive questions that Congress should examine when it reconvenes after the New Year.

It also forms the basis of the Justice Department antitrust charges against the Bell System.

It is to be hoped that users will not become the forgotten third party in the important upcoming proceedings.

'That's $600,000 out-of-purse and $400,000 out-of-pocket!'

Letters to the Editor

What a Difference a Day Makes, Twenty-Four Little Hours...

David Schechter [CW, Nov. 8] overlooked the fact that calendar dates are most frequently and properly input and output in day of month/month/year format and not in day of year/year format.

His observations concerning the utility of internally storing dates in serial form being quite valid, I recommend three articles from the *Communications of the ACM* on date algorithms: Fliegel's and Van Flandern's "A Machine Algorithm for Processing Calendar Dates" (October 1968); Stone's "Tableless Date Conversion, Algorithm 398" (October 1970); and Tantzen's "Conversions Between Calendar Date and Julian Day Number, Algorithm 199" (August 1963).

Arthur F. Kaupe Jr.
Wilton, Conn.

Bring the Sun and the Flowers...

I found David Schechter's article very stimulating. However, I take exception to the formula used to convert a five-digit number (FDN) to a Julian date.

The correct formula should be:

`DDD = FDN - Integer ((YY * 365.25) - 25)`

I believe the error I discovered is only an oversight on *Computerworld*'s part.

Frederick P. Hamble Jr.
New York, N.Y.

Where There Used to Be Rain

Although interesting and perhaps useful, David Schechter's reader commentary, "Storage of Date Information Lacks Inventiveness," may cause confusion and lead to errors.

Besides the fact that the formula was given wrong, I'm sure your readers will be glad to know Dec. 31, 1988 *is* a Sunday. Of course, Schechter must have meant Dec. 31, 1899 was a Sunday

Thomas W. Dowling
San Bruno, Calif.

Straight from the Source's Mouth

Why is it necessary for *Computerworld*'s writers to riddle their articles with sttributions?

The Oct. 25 issue contained an article titled "Modularity Provides Key to Itel Advanced Systems." The article contained the following attributions:

- "Itel said" (used twice)
- "Itel claimed" (used twice)
- "Itel noted"
- "an Itel spokesman noted"
- "he noted"
- "the company said" (used twice)
- "the spokesman noted" (used twice)
- "the firm noted"
- "the firm claimed"
- "according to the firm"
- "Itel is assuming" (used twice)
- "he added" (used twice)

Does CW assume the reader would not believe the facts presented in such articles were it not for the attribution or do you deliberately sprinkle your paper with these annoying attributions?

Anthony R. Dilworth
New York, N.Y.

Since Computerworld does not have the facilities to test and evaluate equipment and services, attributions are used to support claims that are reported, the editor said.

Data Past

Five Years Ago
Dec. 1, 1971

NEW YORK — Univac bought the RCA customer base, and the two companies gave themselves until Dec. 17 to iron out the details of the purchase.

Cash payment on Jan. 2 was to be $70 million, and additional payments based on "varying percentage of future revenues," expected to be in the area of $30 million to $60 million, would be made over the next five years.

— — —

SAN FRANCISCO — The legality of data banking personal information was at issue here as two social workers refused to give their files to the state for computer entry. The two refused to divulge information on such Items as alcoholism, sex offenses or mental illnesses.

The social workers were suspended without pay for five days and then filed suit against the California State Department of Social Welfare. One of their American Civil Liberties Union attorneys noted California law permitted state employees to disobey an unlawful order.

Eight Years Ago
Dec. 4, 1968

WASHINGTON, D.C. — The question of the patentability of computer programs appeared to be headed for a quick decision when the Court of Patent Appeals decided computer programs could be proper subject matter for patents — a holding directly opposite to the viewpoint expressed by the Patent Office in guidelines issued last month.

— — —

WASHINGTON, D.C. — USA Standard Cobol was adopted by the Department of Defense. All Cobol compilers delivered to the department after Jan. 1, 1970 had to provide for the full standard or for one of the new standard subsets.

An Open Letter to President-Elect Carter

The Human Connection

By Jack Stone

Special to Computerworld

Dear Mr. Carter:

Your remarkable victory in the Presidential election deserves a rousing cheer!

During your campaign you spoke eloquently of the needs for reorganizing the executive branch of our government.

You were very clear in your characterization of the current establishment when your speeches included such terms as "nonresponsive," "bureaucratic," "disorganized," "wasteful" and "inefficient."

You expressed great determination to effect change by bringing proper management to the federal establishment.

I strongly agree with your assessment of Federal government operations, particularly as it applies to the management and executive control of government computer centers.

Many of us who have had business dealings with DP centers have developed a sense of despair and disillusionment about the past failures of federal DP.

Now we are recovering some lost hopes from the impending personnel and organizational changes.

Current Situation

What is the current situation in the federal data centers? On the positive side, much intense progress has been made over the years.

The departments have institutionalized DP operations, allocated substantial resources to DP tasks, developed strong in-house technical personnel and sought to exploit new technologies.

Furthermore, much credit is due to the Federal government for building the industry both through its extensive funding of technology R&D and by virtue of its position as the world's largest DP customer.

On the negative side, managerial effectiveness of like departments and staff groups causes grave concern. Troublesome stories of serious management failures run rampant through the trade and public press.

Continuing reports tell of massive welfare overpayments; hardware procurement irregularities; proliferation of underutilized mainframes, including some on lease which are still warehoused; questionable validity of certain global computer/communications systems; inadequate or nonexistent control and evaluation mechanisms; the absence of cost justification studies for new systems; and many, many more.

A recent article published in a magazine for government executives stated the problem succinctly: the federal centers are in a mess.

Complexities Exceed Capabilities

Why has this situation developed? In brief, because the technology and system complexities have outgrown the capabilities of current federal executives to manage and control the operations.

Pressures for new applications, new capabilities and new extensions have forced the rapid-fire installation of one new technology after the other, without breathing space or time for sensible planning.

The government DP executive, regardless of reasons why, has been consumed with the day-to-day problems of getting the machinery up and running and getting the work out the door.

He has not organized properly to bring an orderly, planned approach to his DP function. He has not brought proven management techniques into his DP world. And perhaps, most discouraging, he has not provided the type of leadership DP personnel need and seek.

The results? About what you would expect: insufficient use of hardware; chronic user dissatisfaction; low employee morale and productivity; duplication and overlapping efforts; poor supervisory attitudes; and desires from middle management for quick promotions – up but out of DP!

It is not my intention to single out the federal computing community as the only one with management problems.

A recent article in a prestigious journal for business executives pointed out the large corporations are also searching for answers to serious problems in their DP departments; the article indicated that DP managers had the highest turnover rate last year of any management group in American industry.

It is only that one can't help but be particularly sensitive to the almost unbelievable magnitude of the waste of human effort, machine time and dollars in federal DP – particularly when those are taxpayers' dollars.

What can be done about the current situation at federal DP executive levels? Perhaps the best way I can communicate my approach to this situation is to relate the sense of an encounter I had with a Federal government DP employee several months ago.

I had just completed delivering a lecture to members of one of the DP professional societies (related to one of my favorite themes, "DP managers should stop firefighting, and start managing") and was sitting down at one of the luncheon tables when a man jostled his way through the group, edged out the person next to me and sat alongside.

He first introduced himself as a government DP systems analyat and rather anxiously explained he wanted very much to obtain my views on a serious problem at his agency.

"Firefighting at our center is a gross oversimplification," he said. "We live in total chaos. Projects are defined without our input, manpower allocated without our knowledge, deadlines set without our agreement and hardware hauled in without our training. What can we do?

Guidelines Proposed

I answered, "Let me give you some guidelines that my parents gave me years ago, which I have found particularly useful in my own career.

"First, if you don't know what you're doing, don't do anything.

"Second, if you think you know what you're doing, try it, but be sure to learn from your mistakes.

"Third, don't take on any new tasks until you have made a success of the old ones.

"Fourth, when you take on a new task, set your goals of excellence higher than those of the last task."

(Continued on Page 22)

Readers Get to the Seat of the Overbooking Problem

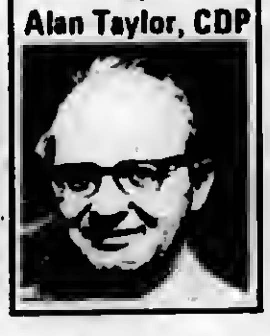
Raphael Murphy Jr. is a bank examiner based in Boston. He has also been an airline no-show statistic.

Murphy explained why he became a no-show:

"I purchased a ticket two months prior to departure. Arriving at the airport in ample time before check-in, I nevertheless was at the end of a long line. American Airlines denied boarding to me and eight others. Needless to say, I have never utilized the services of American Airlines again. My return trip was on Delta Airlines. American was not notified of my cancellation."

The Taylor Report

By Alan Taylor, CDP



Was he correct? Well, under the current system, the Delta reservation might not have been honored either, so the American reservation was perhaps a necessary backup.

There are no good facilities for canceling flights after you are safely on a plane (Eastern Airlines used to offer them on the back of shuttle boarding passes, but no longer). So, I don't think Murphy can be considered dishonest.

Particularly important are the number of people who must have been overbooked (at least nine); the fact everyone turned up early and that Murphy, at least, booked early.

All this adds up to using overbooking parameters based on annual statistics for something like the last flight out of Boston to Miami on Christmas Eve.

Others Shed Some Light

Murphy was not the only reader who added some new light to the overbooking problem. John Trotter pointed out one key problem had been overlooked.

The overbooking problem arose, he argued, not from no-shows alone, but from the fact each airline responded to no-shows by itself and not in concert with the other airlines on an industry-wide basis.

According to Trotter, "The only viable solution for an individual airline is overbooking. Any cancellation penalties imposed by a single carrier would have allowed its competitors to eat it alive. The fair solution . . . is one that must be adopted industry-wide, by all carriers alike."

Can Carrier Go Alone?

The position for the individual carrier may not be as gloomy or hopeless as Trotter stated, judging by the experiences of Whitney Johnson, director of management information systems at Northern Michigan University.

Johnson told me he previously lived in Richmond, Va. and travelled considerably on Eastern. After finding that a flight was fully-booked in first and coach, he found "leisure class" still open.

"Upon investigation, I found that leisure class was really responsible for the overbooking problem," Johnson said. "A leisure-class booking does not guarantee a seat – the passenger gambles and the airline gambles, but both know it. The fare is the same as coach.

"A leisure-class passenger must check in at least 20 minutes before flight time, but only boards after all confirmed seat holders have boarded – and then only if there is space. If he doesn't get to board, he goes free on the next available flight."

Johnson likes this and requests leisure class whenever there is a backup flight later in the day that would get him to his destination in a reasonable time.

Motels, Not Theaters

The question of a convincing analogy for the airline problem was also dealt with and the "theater ticket" equivalent to the "airline seat" theory was rejected by many readers on various grounds.

Instead, everyone seemed to opt for the hotel/motel room with the cancellable-if-you-don't-show-up option and guaranteed reservation system.

Steve Ryder of Austin, Texas, was one who thought this was the seat of the problem.

> *'The only viable solution for an individual is overbooking. Any cancellation penalties imposed by the carrier would have allowed its competitors to eat it alive.'*

According to Ryder, "The real problem is the lack of ability for a passenger to obtain a guaranteed seat. I suggest that this type of ticket be made available [at the regular rate] to anyone willing to prepay the ticket and voluntarily waive cancellation rights.

"Thus the consumer has the choice, if willing to pay the penalty, of getting a really confirmed seat. The rest of us can continue to use the system that has worked well for us in the past."

No-Show Blacklist

S.C.R. Morling, a senior project analyst in Florham Park, N.J., has a hankering to continue using the current system in the same way that Ryder has, but he came up with an alternative to Ryder's solution.

"It is not beyond the realm of possibility to conceive a blacklist of no-shows, Morling said. "These people could be subjected to Mr. Everest's plan."

Other readers seemed to feel the problem was deeper – and that what was being regarded by Morling and others as "convenience" was something more. Miles Fidelman of Boston pointed out single bookings have been missed by him on numerous occasions.

"Ground access to Logan [Boston's airport] is notoriously variable," he charged.

The frequency of the mention of changed plans, schedules, etc., although muted, seemed to me to be significant in defining the system problem involved here.

The airlines have to increase seat loads in the face of competition and when substantial travel – particularly business – is aimed at achieving some goal, rather than attending a specific event.

Event vs. Goal

Event-type travel can be forecast with high precision; aim-type travel just cannot.

A businessman may negotiate everything on the first evening over dinner and, if so, he wants to get back as soon as possible.

Similarly, if after two days the goal is still not achieved, he may want to linger around to settle matters.

The timing of his return flight is unforecastable to this-flight, that-flight precision. All he really knows is that he wants to get home before the weekend. And that is what the airlines have to cope with.

No-shows themselves are apparently a secondary product of the system that the airlines have evolved to face this situation – the no-penalty cancellation (to prevent competitive advantage and to encourage greater travel).

Whether DP is involved in this corporate decision is not obvious and what readers think of it will be discussed later.

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After Comparing AS/5, 370/158

Figures Show Users Spend Less With Itel Than IBM

The following is Itel Corp.'s response to James H. Conole's reader commentary, "Contracting With IBM May Be Cheaper in Short Run" [CW, Nov. 1].

By Ken Hunt

Special to Computerworld

Itel introduced its Advanced System (AS) computer systems to the press on Oct. 14. At that meeting, Itel announced pricing of the AS/4 system at approximately $800,000 to $1 million, depending on memory size, and pricing of the AS/5 models at 65% of IBM's comparable 370/158 purchase prices.

We introduced a family of computers (two CPUs and six models) which are field-upgradable at the customer's site. This means a user can initially install a 1M-byte AS/4 and, over the years, grow it to a 16M-byte AS/5-3MP with 12 operational channels.

This approach is a departure from IBM's requirement that the user must physically trade a smaller CPU for a larger CPU to get the increased capability desired.

It is possible to discuss here frankly and accurately the conservative and educated manner in which Itel evaluates the price/performance of its AS models vs. IBM's 370/148 and 370/158 systems.

Price/performance is truly a measurement of the performance derived from a computer system for a relative price. The price paid for a computer system can be evaluated in a variety of ways, depending on the method of acquisition (purchase or lease) and the length of actual useful life (the number of years the system is retained by the initial user).

In the case of purchase or lease, the anticipated residual (market) value of the system plays a significant role. In the case of lease, It plays a major role because the system must have a reasonable residual value at the end of the lease term.

Reader Commentary

This is required in order for the lessor to claim the lease as "true lease," thereby qualifying him for the full ownership benefits of the investment tax credit, accelerated depreciation, etc. The lessor, in exchange for these benefits, passes along more favorable lease rates than could be obtained through traditional debt sources.

Itel currently has tax-oriented financing available based upon the *lessor's* belief that the AS will have a reasonable residual value at the end of a seven-year lease term.

In the case of purchase, anticipated residual value plays a major part for those considering purchase because of its effect on a cash-flow analysis. The higher the actual residual value, the better the analysis (if the original purchase price is identical with two comparable systems).

Of course, if one system (such as the AS) is much less expensive at the outset and still maintains a reasonable residual at the end of its useful life to the initial user, then residual is not the dominant factor.

Plug Compatibles Strength

In fact, it's probably appropriate at this time to stop and look at raw facts. Based upon actual history and current market values, plug-compatible products have held up very well in relation to their IBM counterparts. To cite some examples in the used equipment market:

- Plug-compatible 2314 disk drives sell for more than IBM 2314s.
- Plug-compatible 360/65 memory sells for almost double that of IBM 2365-1 core boxes.
- Plug-compatible 370/155 and 165 memory sell for 50% more than the IBM 3360-3 and 3360-5 core boxes.
- Plug-compatible 370/158 & 168 memory sell for 80% of IBM's memory.
- Plug-compatible 2401- and 3420-type tapes sell for 40% to 80% of their IBM counterparts.

And, most significant, a plug-compatible CPU that has been marketed for several years to IBM 1130 and 1800 users has a market value several times that of its IBM counterpart. This difference is a result of the use of current (not outdated) technology in the plug-compatible system.

Like Itel's AS/4 and AS/5, it utilizes IBM system control programs, program products, users programs and current systems programs.

To summarize, later in the life of a product it is apparent the user is generally willing to pay *more* for the machine which offers equal or superior function along with more current technology . . . thus the strong showing of plug compatibles today.

Best Financial Decision?

Itel has traditionally offered either purchase or full payout leases on its products. We are marketing the AS in the same manner.

This does not mean, however, that the user must give up his flexibility. Itel's AS can be upgraded in the field to a larger model; and Itel regularly subleases, or takes in trade, equipment which a user no longer feels can do his job and replaces it with more appropriate equipment.

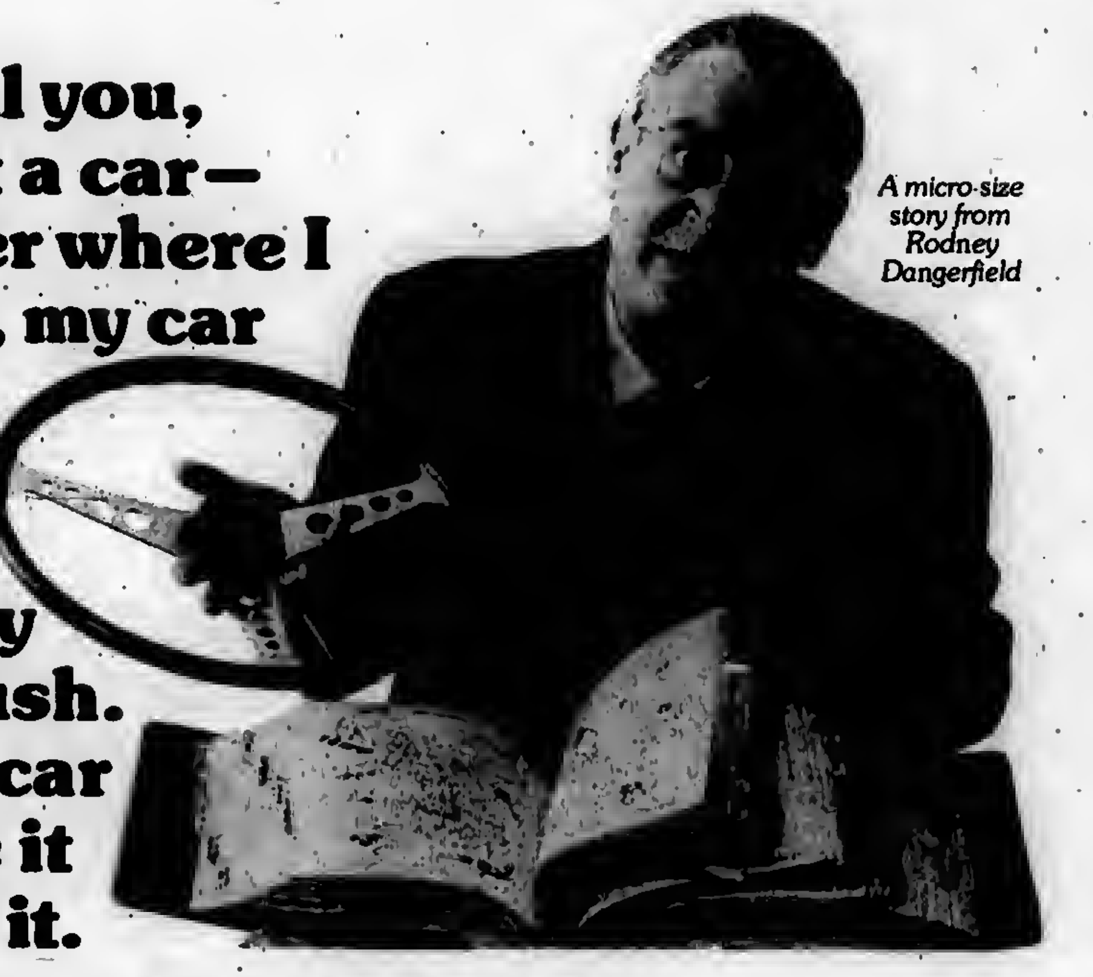
In addition, Itel has been the pioneer in supplying software and peripheral enhancements to extend the life of a system (i.e., 3330-type disks on 360/40 through 360/65 systems, DOS/VS support for 370 users who wish to "reverse migrate" to a 360 and get better price/performance). We will continue our creative thinking.

Let us now take a look at the true savings when comparing Itel wlth IBM. We will look at both lease and purchase on a basis of seven years, a realistic term for the large systems user.

Lease or purchase over a shorter term would, in our opinion, produce significant savings (an Itel four-year conditional sale provides savings of $4,000 to $5,000 per month over IBM's four-year lease plan plus gives ownership to the customer at end of the lease term), but for the purpose of brevity we will concentrate here

(Continued on Page 22)

**I tell you,
I got a car—
no matter where I
want to go, my car
don't want
to go there.
Every Sunday
I take my family
out for a push.
I got the only car
dogs chase it
and catch it.**



A micro-size story from Rodney Dangerfield

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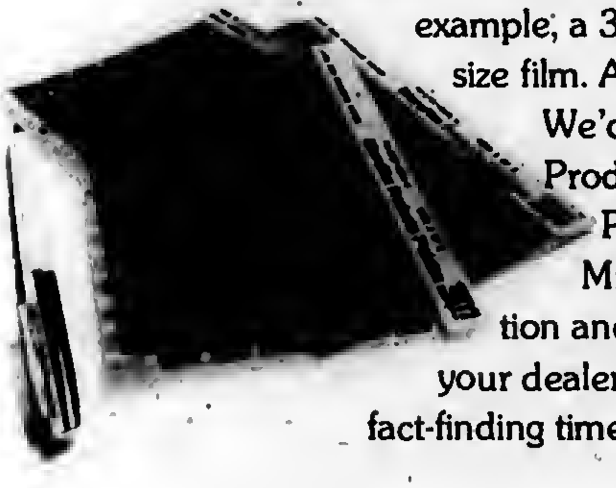

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MEMOREXCELLENCE

Figures Show Users Come Out Better With Itel CPU

(Continued from Page 20)

only on one term.

The equipment used for comparison will be an IBM 370/158 Model 3 with 2M bytes of memory, five block multiplexer channels and one byte multiplexer channel and an Itel AS/5 Model 3 identically configured.

The purchase price of the 370/158 is $2,328,905 plus tax; the AS/5 sells for 65% of the IBM purchase price plus tax.

We assume a 10% debt cost for the user who is in a 50% tax bracket.

In the purchase comparison, we have used an anticipated residual value of the 370/158 at 13% in 1984 based upon the estimate of a company which is well-respected in the computer industry, International Data Corp. Based upon the strength of plug compatibles mentioned before, we could easily project the AS to have a residual value equal to or greater than that of the 370/158, but for purposes of this conservative analysis we will use a worse-case number of one-half that of IBM's future anticipated 1984 residual value.

Further purchase assumptions include:

- Depreciation:
    1. Double declining balance, years 1-4.
    2. Straight line, years 5-7.
- An investment tax credit of 10%.
- No personal property tax (since some states don't have it).
- No insurance added (although it would favor Itel).

When it comes to leasing, the IBM machine costs $2,737,224 ($1,131,329 after tax) after the user makes 84 monthly payments of $32,586. The Itel system costs $1,878,912 ($776,577 after tax) at $22,368/mo.

When it comes to buying, the IBM machine costs $2,468,639 ($992,755 after tax); the Itel system costs $1,604,615 ($661,421 after tax).

Calculations show there are tremendous savings to be realized with the Itel AS. Gross lease payments for the AS/5 are more than $850,000 (or more than $354,000 after tax) less than the IBM 370/158 alternative. And the AS/5 is more than $864,000 less costly for purchase, or more than $331,000 less on an after-tax basis.

In conclusion, Itel's AS is a solid product being manufactured by a well-respected semiconductor company. Furthermore, it is marketed by an innovative, energetic company whose dedication to the industry has been proven through tangible programs and products which benefit the user and provide a financial alternative to IBM.

Itel is the financial alternative to IBM.

Hunt is vice-president of marketing at Itel Corp.

Open Letter to Next President

(Continued from Page 19)

Then, I said "The current management must mend its ways. Center management must: immediately stop taking on new commitments without adequate planning and without finishing up the old ones; stop bringing in new hardware without appropriate staffing and support resources; start looking at more efficient ways of handling software development; and start providing the time, the environment and the feedback necessary for the technical people to do a job of which they can be proud.

"Execution-level central staff members must: commit to short- and long-range plans of the centers and stop changing development plans each week; establish annual budgets for centers and stop interfering with center projects; and focus on the appropriate staff functions of standards and performance evaluation and not operating details."

In conclusion, I sincerely hope the new leadership you bring to the government possesses the experience and knowledge necessary to apply this magnificent computing technology to government problems in an intelligent and practical manner.

Toward this goal and on behalf of the industry, we pledge to you our wholehearted and enthusiastic support.

Sincerely,
Jack Stone

Letters outlining questions, issues or situations pertinent to human relations in the DP setting may be addressed to Stone c/o Computer Education International, Inc., Suite 222, 2233 Wisconsin Ave. N.W., Washington, D.C. 20007.

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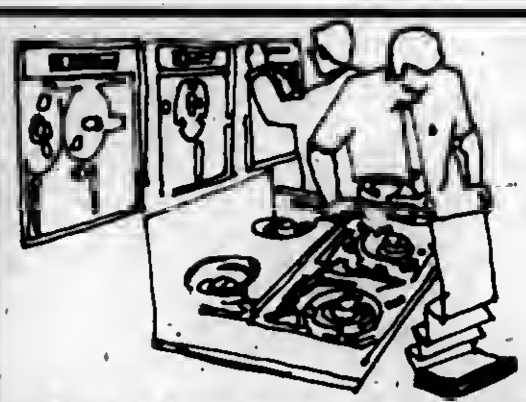

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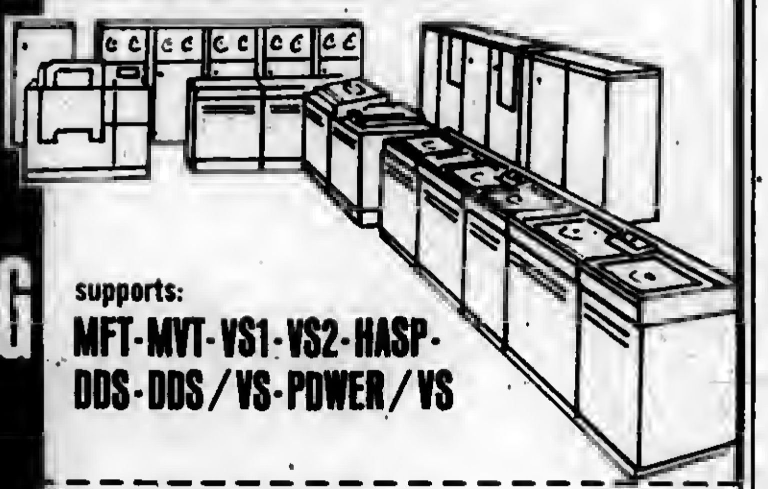

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Michelson Award Goes to Fedsim Star

ATLANTA – Philip J. Kiviat was presented with the 1976 A.A. Michelson Award for the advancement of computer systems measurement at the recent annual conference of the Computer Measurement Group (CMG) here.

Although given by CMG, the award caps an extensive screening process, including consultations with leaders of most of the major computer performance evaluation (CPE) groups, before the winner is selected, according to DMG Director David Schumacher, who made the presentation.

Previous Michelson award winners have been Kenneth Kolence and Thomas E. Bell.

Obviously pleased with the award, the puckish-looking Kiviat, technical director at the Federal CPE and Simulation Center (Fedsim), said he is also pleased with the growing acceptance of the need for performance management in many DP centers.

Among the contributions made by Kiviat and listed in the citation that accompanied the award was the Kiviat graph, described as "a simple method for presenting multiple performance measures, each with no predetermined ideal, in such a way that the measures have an easily recognized meaning."

The citation also saluted the winner's "setting and meeting high standards of professionalism for the application and reporting of [CPE] within the U.S. government" through his post at Fedsim and the enthusiasm with which he pursues his duties there.

Kiviat's chairmanship of the Association for Computing Machinery's Special Interest Group on Computer Metrics (Sigmetrics) was noted in the citation, along with his "chairing dozens of conference sessions, serving as program chairman and serving as general chairman for [CPE] conferences through the international level."

His design and development of Gasp – "an easy-to-use simulation language" – and the "more comprehensive" language, Simscript, were also listed on the citation as among Kiviat's "singular contributions" to the field of computer performance measurement, evaluation and management.

Vendor Funding Encouraged

CPE Evolving Into Performance Management: Kiviat

By Don Leavitt
Of the CW Staff

ATLANTA – Three separate developments have combined to force DP managers to become interested in computer performance evaluation (CPE), but the classic interests of CPE – limited to the internals of the equipment – aren't good enough anymore, according to Philip J. Kiviat.

The increased number of on-line systems has made the efficiency of the DP center highly visible to many people. System failures in that environment can't be hidden as they might have been in batch mode operations, he reminded the Computer Measurement Group (CMG) as he accepted the A.A. Michelson award recently.

The technical director of the Federal CPE and Simulation Center (Fedsim) also pointed to the growing complexity of operating systems and the real acceptance of proprietary software packages – "where you don't really know what's going on inside" – as factors behind the upsurge in attendance at meetings such as CMG and – just a week earlier – the CPE Users Group (CPEUG).

Change of Label

While the hope for cost savings through CPE efforts still exists, Kiviat said, the concern now is for performance and for the control of changes that seem almost beyond control.

These are, or should be, the classic concern of managers, he added, and therefore the phrase "computer performance management" (CPM) probably should replace the more limited CPE.

This change in concern has helped CPE technicians gain a degree of professional status because, "all of a sudden, DP managers – or their bosses – see they need us to help if they are to achieve their own ambitions."

The use of CPM as a label for what is needed should remind all involved in DP that the "new" task of CPE is to deliver service to whoever needs it "from the total installation."

It is no longer acceptable to "optimize" the hardware if the support functions aren't as effective as they might be, Kiviat indicated.

This might mean a greater interest in the role of people within the DP center, he said, but it also means – in highly distributed processing systems – that CPE technicians have to see their efforts limited by completely new problems, data communication equipment delays on the one hand and user interfaces – "think time, for example" – on the other.

Savings Now Secondary

In the large systems that are being put together, the dollar-saving goal is secondary, Kiviat said. An interest in the capacity of the system and support for the need to predict when it may become saturated has become dominant, he pointed out.

"We're obviously willing to share our experiences with one another, otherwise we wouldn't be here," he noted, "but we have to make much greater commitments and encourage vendor participation in a broad-ranging program of investigation" if DP organizations are to remain in control of their responsibilities.

"Real constructive work on applications and solid investigation into the theories behind computer operations is urgently needed," he went on. "Current projects in this direction have been poverty-stricken.

"I see a need for corporate investments in such investigations," and DP vendors "should certainly be encouraged" to provide funds to independent organizations such as user groups to encourage such work, Kiviat said.

"It's unimportant which group they support; we tend to work together anyway," he said, noting he wasn't necessarily making a "sales pitch" for funds for CMG.

Afterwards, he said he felt funding in the form of grants by vendors would not jeopardize the not-for-profit tax status that various user groups hold.

For their part, the practitioners and theoreticians were urged by Kiviat to develop a comprehensive discipline so the current separation between measurement of "real" systems and simulation of proposed ones would no longer exist.

Even the measurement of current systems is fading in its importance, he said, explaining hardware vendors are quite generally providing raw measurement data.

User Paradox

Modeling is going to grow in importance, Kiviat said, although users face a paradox: details of how the operating systems and the proprietary packages really work are today more hidden from view – and more vital if the models are to be any good at all.

The development of CPM – rather than just CPE – means the technicians will be spending more time on design and planning of systems and less on after-the-fact tuning, he added.

CPE Proceedings Now Available

Both the Computer Performance Evaluation Users Group (CPEUG) and the Computer Measurement Group (CMG), which held annual meetings a week and a continent apart this month, have copies of their proceedings available for distribution.

Each is bound in soft covers and is about 230 pages long.

Papers from the 12th meeting of CPEUG cost $10 – checks should be made payable to CPEUG – from the National Bureau of Standards, A265/Technology Building, Washington, D.C. 20234.

The CMG proceedings are available for $35/copy from Ian K. Roome, CMG treasurer, at McAuto-West, 3855 Lakewood Blvd., Long Beach, Calif. 90846.

Some copies of proceedings from past CMG meetings are also available for the same price, Roome noted.

Although some papers did not reach the CMG proceedings editor in time to be included in this year's proceedings, they will be published in the group's quarterly publication as they are received, he said.

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Data General's AOS Controls Eclipses Heuristically

SOUTHBORO, Mass. – The Advanced Operating System (AOS) introduced by Data General Corp. (DG) for somc members of its Eclipse family enables C/330 and S/230 users to control multiple, concurrent time-sharing, batch and rcal-time operations, the company said.

AOS is said to schedule operations by monitoring all activities and adapting the system to user priorities and the past behavior of the tasks being performed.

This "heuristic" approach makes efficient use of memory, CPU time, mass storage and peripheral units, a spokesman explained.

The system also provides a number of user-accessible capabilities. A Command Line Interpreter (CLI), for example, makes system functions available to terminals users and handles interactive and batch jobs without a separate job control language.

The CLI macro facility combines a complex series of instructions into a single command.

A "smart" spooler gives multiple users access to a single output device and is said to give each one orderly service. Queue control allows operators to alter priorities.

A dynamic visual display of system activities allows operators to check the current status of each user's process.

Hardware error logging and on-line reporting with soft error retry and recovery aids system maintenance.

The number of concurrent time-sharing users varies with the complexity of their work and the languages being used. In a demonstration, however, DG ran 12 interactive terminals, a simulated building security process control operation and two simple batch jobs

AOS is described as "process" oriented – a process being "a group of program tasks that share up to 64K bytes of memory address space and compete for system resources as a unit," DG said.

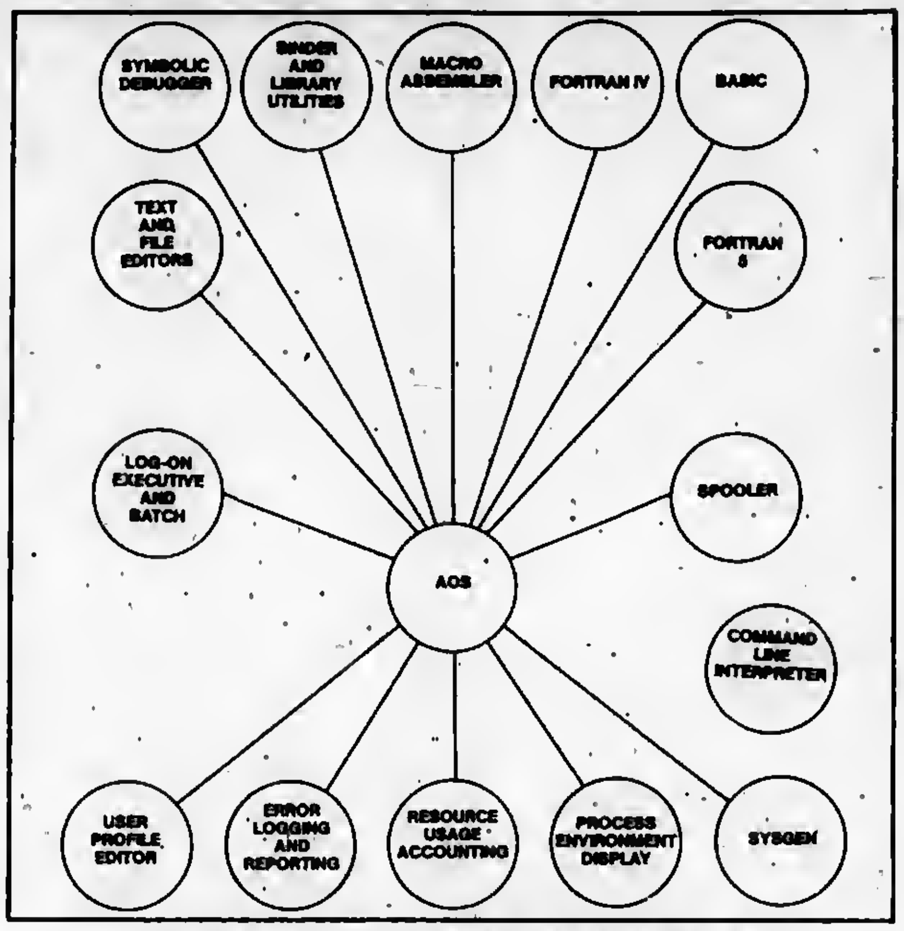
Each proccss is allocated a set of resources and privileges which define how much CPU time and memory the process can use.

All proccsses in the system are organized into a "family tree" and a parent process can, based on its own privileges, create offspring processes and define their privileges.

If AOS observes a swappable process is compute-bound, it will increase that process' share of CPU time when it next becomes eligible to run, but lower its priority to allow interactive jobs to run first.

AOS resource management capabilities include dynamic memory management, with sharing of common code and data to reduce memory requirements, and support for program overlays.

It also offers data management with hierarchical directories for file security, dynamic allocation of disk space and hierarchical structures for fast file access, DG said.



Components of the Advanced Operating System

Synchronous and asynchronous communications can be integrated into the operating system, and support for the DCU/50 communications processor reduces CPU overhead, the spokesman added.

AOS also provides support for the multiprocessor communications adapter to link Eclipses.

"Typical" S/230 and C/330 systems that might use AOS have 256K bytes of memory, at least one 100M-byte disk, a 9-track magnetic tape drive, communications multiplexer, a mix of eight- to 12 terminals and/or a printer.

A license fee or $2,500 includes all system features with the exception of Fortran IV, Basic and Fortran 5. The addition of these three languages would bring the user's cost to about $5,000.

DG is on Route 9, Southboro, Mass. 01772.

Tandem Adds Data Base, Communications Software

CUPERTINO, Calif. – Tandem Computers, Inc. has added a data base record manager, a CRT screen formatter, a data communications manager and a series of utilities to the software intended for its Tandem 16 Nonstop computer system.

The data base software, Enscribe, supports a method of defining, accessing and updating common records and is said to be capable of providing service to "hundreds of terminal users."

Stressing the security aspect of the system, Tandem claimed Enscribe ensures that indexes within a data base are not corrupted by any failure.

The software also provides an optional "mirroring" capability with which duplicate disk-based files are created simultaneously, if a failure eliminates access to one, the other will be available, Tandem said.

Enscribe supports a record-locking facility so records being updated by one user cannot be accessed by any others until the first operation has been completed.

Enscribe sells for $6,000 and will be available in February.

The CRT screen formatter, Entry, allows users to design screens interactively on page mode display terminals. Individual fields within each screen may be named so editing rules and access to the data is simplified, according to a spokesman.

This validation and retrieval tool costs $2,000, he added.

Envoy, the data communications package, supports both asynchronous and synchronous operations with single or multi-drop lines on either a local or remote basis, Tandem said.

Data transfers from terminals to main memory occur on a direct memory access basis. Processor interruptions are therefore not required to handle incoming data, the spokesman continued.

In binary synchronous operations, terminal polling end character translation between Ascii and other codes is hardware-executed, leaving the processor free to handle applications work.

Both Envoy and the utility software, called Ensure, are considered part of the basic system and are free, Tandem said from 20605 Valley Green Drive, Cupertino, Calif. 95014.

D.C.: A 'Nice' Place in the Spring

BETHESDA, Md. – A National Information Conference and Exposition (Nice), sponsored by the Information Industry Association (IIA) and scheduled for next April in Washington, D.C., will focus on "The Emerging Information Manager: Bridging the Information Gap," according to the association.

More information about the conference, which will run April 18-21 at the Shoreham Americana hotel, is available from IIA at 4720 Montgomery Lane, Bethesda, Md. 20014.

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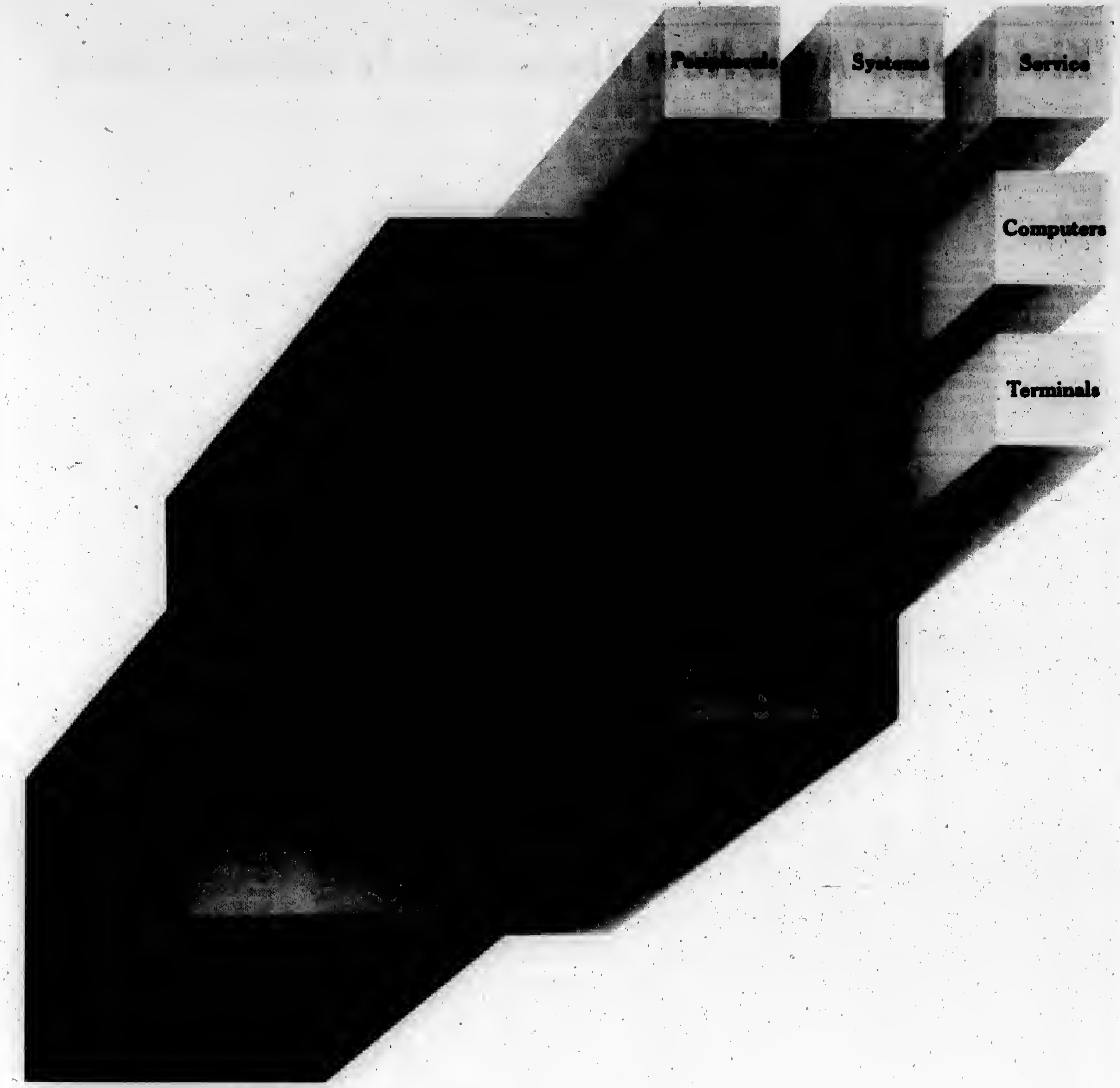

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'Kiviat Blob' Adds New Dimensions to System Tuning

Special to Computerworld

SUNNYVALE, Calif. – Robert C. Coolidge, vice-president of marketing for Boole & Babbage, Inc., has just announced the formation of a Hybrid Tools Division. This division will develop measurement products that combine software and hardware techniques to plunge into new frontiers of system monitoring and optimization.

The first product scheduled for release from the fledgling department is a totally new approach to measurement called the "Kiviat Blob." The Blob is a multidimensional extension of the time-honored concept of the Kiviat graph.

Of course, the graphs are merely two-dimensional and present a single static picture of system performance. In contrast, the Blob is four-dimensional!

The product includes one or more laser-driven holographic projectors which create a 3-D image of system status in mid-air, right before the gleaming eyes of the performance engineer! The fourth dimension is time: The projector is directly coupled to an on-line monitor so the projected image varies in real time to provide an instantaneous dynamic image of system behavior.

The images glow brightly in a full spectrum of colors. Each address space or initiator in the system has a different color and glows, flashes and changes shape to display the current activity. When your system is "in the pink" you will actually see it (no need for rose-colored glasses).

If the system crashes, the Blob warns you by shrinking to an ominously glowing red sphere.

Imaginative users will find many fascinating ways to use the Kiviat Blob. Each projected Blob may be set independently for any diameter from one inch to 500 feet and may be focused at any desired location.

Thus, one user may generate a small Blob to hover near his desk, while another may focus a Blob two feet in diameter up high in the computer room so everyone may observe system performance.

The DP community often takes itself very seriously, but whimsey breaks through on occasion.

According to the person who sent us the accompanying article, it was written by an unknown technician at Boole & Babbage, Inc. and posted on that company's bulletin board as a relief from the strains of the day.

This can give added incentive (or pressure) to the computer operators to keep the system in the pink.

One beta-test user focused an image 250 feet in diameter in the sky near his office so he could go home at night and still monitor the system by looking at the Blob from his living room window.

(Caution: FAA regulations prohibit the projection of Blobs more than 1,000 feet above ground because they confuse pilots. Furthermore, hippie groups tend to congregate near such Blobs and watch them during LSD trips.)

The Blob projectors can be set to store the same images they are projecting, so selected time periods may be reviewed later and may be replayed either faster or slower than real time.

The Blob provides up-to-the-microsecond information about the monitored system, but the amazing thing is that it requires no main storage, no CPU time and none of the devices of the system being measured!

The monitor program resides in a separate computer, and every microsecond it updates its status information by examining the monitored system through a channel-to-channel adapter. The monitor itself executes in a dedicated 370/168 with a minimum of 4M bytes of real storage.

Beta-test users have already found the installation of the Kiviat Blob monitor has allowed them to increase throughput by 20% to 40% on the measured system. If you can use that kind of improvement, call the Hybrid Product Manager today!

In closing, our source whispered that plans under development now will add another dimension (the fifth dimension) to the Blob: sound! With the addition of computer-generated music and sound effects, new meaning will be added to the concept of system tuning.

No release date is available as yet since Boole & Babbage is still in the midst of difficult negotiations with the Sunnyvale Philharmonic.

Upgraded Software Enhances Sycor 400

ANN ARBOR, Mich. – Software now available from Sycor, Inc. for its 400 series of distributed data entry and processing systems provides additional utilities and permits dynamic system configurability, the company said.

The ability to dynamically reconfigure the system allows a user to structure memory and resident software to permit the 440 or 410 to act as a clustered intelligent data entry device, a remote job entry terminal, a satellite printing station, a Cobol processor or a system with concurrent foreground/background processing, a spokesman added.

A dump/restore capability provides a means to create a backup copy of any part of the system's fixed disk. Run as a stand-alone program, the dump/restore utility crestes a cassette, magnetic tape or flexible disk which may then be used to reload and restore the files, he said.

A construct utility is also provided to reinitialize a 400 system and restore system files from a "cold start," he continued. The program is contained on the unit's flexible disk or cassette, depending on the user's configuration, and verifies the reconstructed disk against the contents of the flexible disk or cassette.

The software release supports the ability to use both the company's typewriter- and keypunch-style keyboard terminals in the same cluster. It also supports magnetic tape, card readers and flexible disk interchange with the Sycor 350 intelligent terminal.

Using the software system, a Sycor 400 system can act as a master station unit for transmitting data to and receiving files from unattended remote Model 340s, 350s or other 400 series systems using point-to-point IBM 2770-compatible binary synchronous communications over switched or private lines, Sycor said.

The software is free, Sycor said from 100 Phoenix Drive, Ann Arbor, Mich. 48104.

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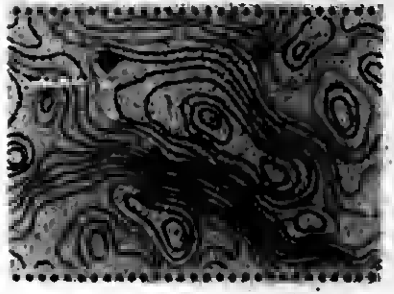

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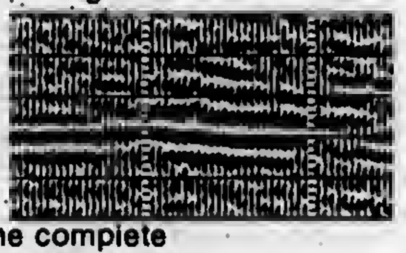
Next, the microprocessor: While serving many controlling and computing functions, this 2K X 8RAM* also serves as a buffering memory to counter the "asynchronous" actions of a CPU. This then benefits the user by further smoothing out the complete output-to-document cycle as well as dramatically reducing the "gray bars"*.



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Good Management Helps, Too

DBMS Enhances Insurer's Ability to Aid Customers

By Orin Huffman
Special to Computerworld

LANSING, Mich. – How did Auto Owners Insurance Co., which originally provided only automobile insurance to one state 60 years ago, grow to a full-facility insurance underwriter with annual sales of over $195 million in 16 states?

Good management, mostly. A management that since the early DP days has been extremely innovative and aggressive in automating the routine, repetitive internal operations, such as accounting and rating policies, in addition to providing rapid response to customers.

It was a slow, consistent process. Step by step, we developed new projects and constant studies. This also allowed us to hold our number of employees quite low, which has a very favorable bearing on the overall expense ratio.

We started our first computer-based automobile policy-processing system in 1958, and we've been rating private and commercial policies since 1964. Our main accounting system is also quite advanced.

We currently operate with an IBM 370/158 and have three automobile data base files totaling over 1.8 million records managed by Adabas, the data base management system (DBMS) from Software AG, and utilize three IBM 3330-11 disk drives.

There are 35 data entry stations from General Computer Systems, and inquiry is via 24 CRTs supplied by Courier. Approximately 30,000 to 40,000 documents are printed daily on three IBM 1403 N1s.

This original commitment to the data base concept has paid off. Good service is our major marketing tool.

In our 16-state region, we deal with over 2,000 insurance agents. They choose our coverage because they know from experience that they will have the client's policy promptly, that claims will be processed as expediently as possible and that we will provide special services when requested. Auto Owners prides itself on the speed with which claims are settled.

The turnaround time on issuing policies is directly related to our automobile data base files. When a branch office receives a request for coverage from an agent, it determines whether it will accept the risk.

If the risk is accepted, the information is keyed onto IBM 3741 or 3742 diskettes and dispatched daily to the main office here, where the diskettes are transcribed to magnetic tape for batch entry.

Batch processing is handled daily in two shifts. An average of 600,000 auto policies are read every day. This includes original coverages, endorsements, renewals, cancellations, billings, etc.

Direct Collections

The direct collections system is a fairly recent option available to certain agents. In this case, the customer is billed directly by Auto Owners and may choose to pay either in full or in three equal payments.

There is a small fee to the agent for utilizing our direct payment system. This is quite attractive to a large agent because it cuts down drastically on his own office staff, bookkeeping problems and expenses.

In many cases, the payments come in without the bill or policy number. As a result, although this department has the smallest data base, it has the largest inquiry rate.

Nine people using five CRTs make an average of 1,500 on-line inquiries a day. Adabas' phonetic capability has been extremely useful here.

Where we have no policy number, we can easily find the insured phonetically and verify his policy number and payment amount.

Adabas has probably had the largest impact on personnel in this department. Without it, we would need 20 employees instead of nine to handle the workload. And at the rate this system is growing, this will continue to be quite important to us.

We had moved from an IBM 370/155 to a 370/158 and solved a lot of scheduling problems based on real memory constraints. When we went to the 158, we had already made the commitment of ultimately utilizing interactive programs, the data base concept and a telecommunications network for data entry and inquiry.

Because of our vast number of records, our automobile data base was becoming unmanageable and was consuming too much storage space. A study committee recommended that we investigate other options for data base management. A number of suppliers were contacted and visited.

After a paid demonstration in September 1975, we made the commitment to convert to Adabas last January. We also made the commitment to utilize IBM's Customer Information Control System (CICS) as our communications link.

The next three months were spent in learning how to best use CICS and Adabas and in implementing our conversion. In May, our first data base was in production. The conversion went quite smoothly and the simplicity of using the new system was a great asset.

Our next system, the loss data base file with 200,000 records is slated to be operative around the end of next February. By the second quarter of '77, we will have our entire fire and homeowners business on-line.

We are currently building this data base, which will have 11 files totaling over one million records. We'll be adding four IBM 3350 disks for storage (with room to spare) and 11 CRTs for inquiry capability.

Both systems will have the same format and applications as our automobile system. With these three data bases operating, we will be in a position to cost justify a telecommunications network from our remote branches, which we would like to implement over the next two to three years.

Huffman is assistant vice-president/data processing at Auto Owners Insurance Co. in Lansing, Mich.

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On-Line DBMS Coordinates System Reliability Files

By Robert Dobbin and Dennis Stange
Special to Computerworld

SANFORD, Fla. – One of the major tasks of the Stromberg-Carlson (S-C) Reliability and Maintainability (R&M) Engineering Group is the assembly and analysis of data related to the performance of the company's newly announced "System Century" telephone systems.

The data required ranges from detailed information on electronic components to the configuration of complete systems. Telephone switching systems are complex, using thousands of electronic parts, and system configuration depends on the telephone line capacity and service features required by a specific customer.

Fortunately, although there are many types of printed wiring board (PWB) assemblies used in any system, a particular type of PWB may be used from two to several hundred times, and standard electronic parts are used on the circuit boards. Thus, an opportunity existed to build a data base that would require minimum effort to update and keep current, providing there was a means to use the data in one file to operate on or collate data from any or all of the other input files.

S-C selected the Nomad data base management system (DBMS) on National CSS's timesharing network as the system for managing this flow of data.

With Nomad the R&M group can obtain rapid turnaround of data and remain current with any design or configuration changes in the System Century. Nomad also has the flexibility in output while using relatively simple, easily maintained input files.

Prior to the DBMS, useful information was obtainable only by laborious manual cxercise and was therefore updated irregularly and usually on an urgent basis. This does not, of course, help in advance planning or early identification of potential problems.

NCSS provided training for S-C personnel and has helped develop the data base and procedures. The person selected to work with Nomad had a general knowledge of the S-C systems and limited computer experience. The overall results have proved to be extremely satisfactory.

One of the missions of R&M engineering is to measure the reliability performance of the product and ensure that it meets the product goals. To assist in this task, three basic data files have been created:

- Electronic Component File. This file contains information for each component type and value, and the data includes S-C part number; generic type; values, tolerances, etc.; and failure rate information.
- Printed Wiring Board Files. PWB files identify the part number, quantity and stress of each electronic component used on the PWB.
- System File. This file contains the listing of PWBs and the quantities used in any-configured system.

Changes and modifications can be made to the basic input files and the impact to the total system can be rapidly determined. From these basic input files other output files can be constructed and analysis of various system configurations can be made.

Present results indicate Nomad could provide an excellent tool for advance planning for electronic systems development and production.

Dobbin and Stange are reliability engineers within Stromberg-Carlson's Reliability and Maintainability Engineering Group.

Programmers Finding How to Use PERFORM

By Stephen E. Wright
Special to Computerworld

Concepts and Techniques

The implementation and use of the PERFORM verb in Cobol is an interesting case study in the harmful reinforcement of attitudes by software designers and users.

When Cobol was first proposed, it was obvious to everyone that a closed subroutine facility was needed. The PERFORM verb was specified for this facility. It has been implemented ever since by linkage mechanisms more or less costly in terms of execution time and space.

Users aware of these costs studiously avoided the use of PERFORM except to execute a procedure from more than one point in the program.

The advent of structured programming led to a quite different application of PERFORM. It became the mechanism for invoking modules within the hierarchical structure of program control.

This led to using PERFORM in ways that 10 or 15 years ago would have sent experienced programmers into hysterical fits. We now see programs with a module PERFORMing another module which contains little more than another PERFORM, and so on down the line.

And for very good reasons – it is these "unnecessary" PERFORMs that allow the decomposition of large programs into manageable pieces.

This technique of hierarchical control is meeting with some resistance because of the costs in time and space. It is important to note, however, that these costs are a historical artifact.

There is no reason why implementors cannot provide completely cost-free implementation of such PERFORM statements by placing the invoked code *in-line* in the object program. An indirect advantage is improved performance in a VS environment.

The disciplined use of hierarchical control and the availability of efficient implementations should reinforce each other in the future.

Wright is a senior staff consultant at Applied Data Research, Inc. in Princeton, N.J.

CDMS Price to Stay Down If Users Tell Intent to Buy

WELLESLEY, Mass. – Although Cullinane Corp. has announced a price increase for the Cullinane Data Management System (CDMS) as of Jan. 1, users may acquire the system or any of its components at current prices until March 31 if they submit a letter of intent by the end of the year, a Cullinane spokesman said.

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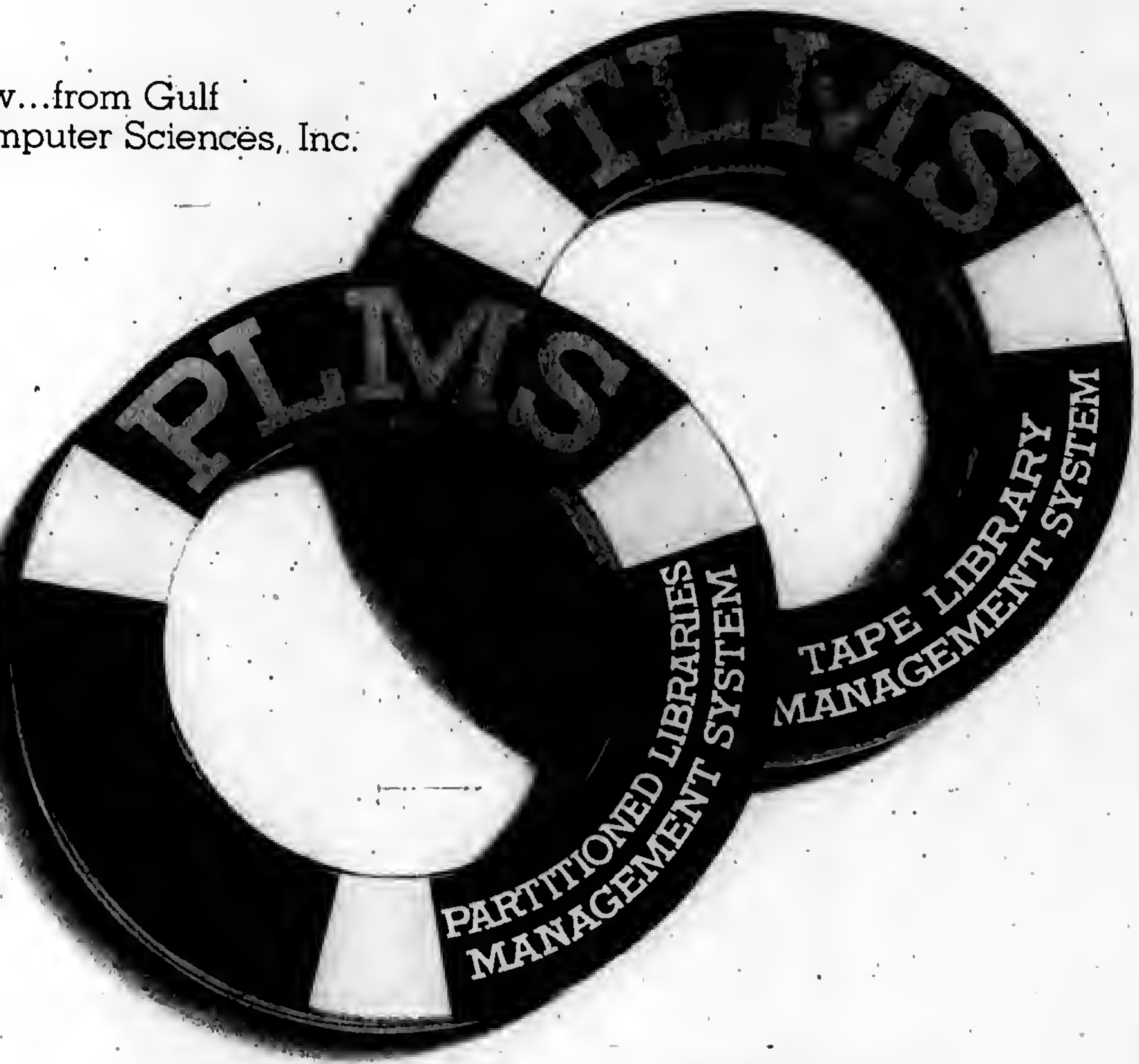
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FCC Told in Briefing

Small Users Suffering From Big Network Access Costs

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. – Despite improvements in data transmission facilities since the 1960s, high access costs to digital nodes still plague commercial users whose operations are small and located outside main metropolitan areas, the Federal Communications Commission (FCC) was told recently.

Another area of user concern is "the very high cost of international links," Alex Curran, president of BNR, Inc., told the commission at a technical briefing provided by the American Federation of Information Processing Societies here.

"Research and innovation is needed at these two network limits," Curran said. If the cost of network access for smaller users and the cost of intercontinental transmission can be reduced, common carrier networks will be able to cope with commercial users' traffic, he added.

"Today there are adequate offerings to cater to the needs of users in large metropolitan areas, but that isn't enough. It is already clear some office and home services will depend upon the ability to reintegrate voice and data capabilities," Curran stated.

In addition, some services proposed for widespread implementation "will require that switching machines recognize information specifications as valid addresses," he said.

The boundary between communicating and computing will become more blurred, Curran predicted, highlighting one key problem the FCC faces in carrying out its regulatory responsibilities.

But "there are economic arguments for suggesting that the boundary definitions be relaxed to encourage a new cycle of innovation," he suggested.

If effective solutions to the switching, distribution and terminal needs of the homeowner can be developed, then "embryonic" services like electronic mail, electronic news services and subscriber response measurement systems might begin to grow, Curran told the commissioners.

"Users of remote access data processing systems are notoriously critical of the services offered – and the performance levels acheived – by the telecommunications common carriers," he said in his description of the industry to the FCC.

The organization of teleprocessing services might have something to do with user expectations, Curran suggested. The user wants access to specific information; if the information is remote, then telecommunications is necessary – but it shouldn't restrict the speed or accuracy of access, he said.

"The ideal telecommunications link is totally transparent to the information flow," he continued. "That makes the market a very difficult one to serve."

Four Stages of Development

WASHINGTON, D.C. – Officials of the Federal Communications Commission (FCC) were briefed here recently on the history of data communications services by Alex Curran, president of BNR, Inc.

Curran traced the evolution of communications services for institutionally based users by identifying four developmental stages at a technical briefing provided by the American Federation of Information Processing Societies.

Nonreal-time data transfer gave the first growth impulse to the industry in the 1950s, Curran said. Time-sharing followed when it became feasible in the 1960s.

Message service became a computer-based possibility in the late 1960s. And finally, transaction systems are today of increasing importance, he said.

Each of these stages has imposed different user requirements on telecommunications networks for transfer rates, response times, tariff structures and geographic extent, Curran noted.

Very large corporations' inventory and shipping control systems are typical users of nonreal-time systems, he told the FCC. Their data is truly bulk data, accumulated over the business day at a distributional office and then transferred all at once to the regional or head office.

Transmission times are in the range of 10 minutes to 30 minutes at transfer rates of 2.4- to 56 kbit/sec, Curran said, adding such service is attractive to large firms located chiefly in the business districts of large metropolitan areas.

The telecommunications response at this stage involves high-speed point-to-point channels; a network accessing large metropolitan centers; reliable, low error rate transmission paths; and no complex switching problems, Curran said.

Curran predicted this view of the telecommunications link as "at best a necessary evil" will change as communications networks become more active in providing DP services.

"DP is still an activity reserved essentially for institutions," he told his audience. Computer hobbyists and the National Aeronautics and Space Administration and Department of Defense networks represent extremes not representative of the predominantly commercial market, he added.

Statistics for the U.S., Canada, Europe and Japan indicate remote DP is still a small industry, where "small" is qualified in relation to the total telecommunications or information processing markets. Figures for data communications for these countries cluster around 1% to 2% of the total telecommunications traffic, for example, Curran stated.

He also noted that high growth rates, in the neighborhood of 20% to 25% annually in some cases, lead to projections of large and rapid investments in this area.

T/S Responses Different

Aimed principally at medium-sized businesses, time-sharing requires a different response, Curran went on. These businesses are generally too small to own self-sufficient computing facilities, but large enough to employ a technically competent staff.

Access to a network is required in many smaller centers and, within those centers, at locations outside the main business district, Curran said.

(Continued on Page 31)

DG Terminals Offer Physical Flexibility

SOUTHBORO, Mass. – Data General Corp. (DG) has introduced two 1,920-character CRT terminals with detached keyboards and a pedestal base which it said enable operators to swivel the screen both horizontally and vertically for easy viewing.

The top-of-the-line version, the Model 6053, offers direct cursor addressing and sensing, allowing high-speed cursor positioning and control with minimum processor overhead, DG said.

Its full-function keyboard contains an 11-key numeric pad, separate keys for editing and cursor positioning, 11 user-defined function keys for high transaction throughput and an upper/lower case Ascii character set.

Optional fonts are available for France, Germany, Sweden and the UK, the company said.

The terminals offer character highlighting features including character blink, character underscore and programmable dual intensity.

The display is organized in a 24-line by 80-character format over a 6-in. by 9-in. viewing area. Characters are defined by 5 by 8 dot matrices.

The terminal interface operates asynchronously at speeds up to 19.2 kbit/sec, DG said, and hard-copy output is available with a receive-only 60 char./sec Dasher printer option.

The Model 6052 "basic" unit does not include underscore and dual-intensity features. Its teletypewriter-style keyboard contains a 64-character upper case Ascii set and eight function keys.

The monitor is said to be the industry's first to swivel on two axes, and a bonded faceplate over the display is aimed at reducing reflections and glare from overhead lighting.

All adjustments are on the outside of the display case except for volume control of the audible end-of-line indicator, DG noted. The detached keyboard may be placed as far as four feet from the monitor.

Both terminals will be offered with DG's Nova and Eclipse minicomputer systems, according to a company spokesman. The Model 6053 was designed for utilization in implementing Eclipse C-330-based Interactive Data Entry/Access (Idea) systems in which the primary application involves interactive multi-terminal data entry and access.

The Model 6053 is priced at $2,290; the Model 6052 costs $1,990.

A hard-copy printer interface option costs $400 and the hard-copy 60 char./sec printer with interface sells for $2,500.

Quantity discounts are available from the firm at Route 9, Southboro, Mass. 01772.

The Model 6053 is said to be the first display to swivel on two planes.

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Works With Other Vendors' CPUs

Burroughs RT 5000 Teller Handles EFT Transactions

DETROIT – Burroughs Corp. has introduced an automated teller machine (ATM) which will reportedly perform a full range of financial services, including electronic funds transfer (EFT) from a local or remote site.

Burroughs RT 5000

An addition to the RT 2000 and RT 4000 remote teller systems, the RT 5000 utilizes a Burroughs ~~B80~~ processor to drive a CRT display and console with a customer guidance panel to communicate with a bank's CPU, Burroughs said.

The RT 5000 allows a bank's customers to inquire into their account balances, withdraw cash from savings or checking accounts, charge cash withdrawals to credit cards, make deposits, transfer funds between accounts and pay bills by debiting an account with cash or a deposited check, according to a Burroughs spokesman.

An RT 5000 includes 4K bytes of read-only memory (ROM), 40K bytes of read/write memory for the transaction interpreters, generated application software, display texts and derogatory files, he said.

CPU compatibility with mainframes other than Burroughs CPUs is achieved through synchronous and asynchronous communications, he said. The respective transmission speeds for these types of operation range from 2,400- to 4,800 bit/sec and from 75- to 1,800 bit/sec.

Multiple Mainframe Compatibility

Communications to non-Burroughs mainframes in these modes take place over dedicated or dial-up lines. Full-duplex lines are used in a half-duplex mode, resulting in half-duplex system operation, the spokesman noted.

The RT 5000 is compatible with all Burroughs CPUs, he said, and operates over 15,000-ft hard-wired cables at speeds from 1,200- to 9,600 bit/sec.

A transaction-record impact printer matched with the system operation makes an original and one copy of each transaction and can put up to four transactions per customer on one receipt, according to the spokesman.

In addition, magnetic tape cassette capability is provided with a capacity of 220K characters for the RT 5000 and can be used to record all transactions as a back-up to on-line operations, for off-line recording or for batch transmission of transactions to a CPU for account updating, the company said.

Self-Scan Display

The CRT console of the ATM has a self-scan plasma display for messages up to 256 characters in length. The console also contains a standard 10-key numeric keyboard with additional "yes" and "no" keys, the spokesman noted.

The system is operated with magnetically encoded plastic cards with a choice of magnetic stripe options; the RT 5000 card reader will accept only cards encoded with the proper stripe configuration, he said.

In operating the ATM, a customer inserts the card which opens a security door providing access to the display and keyboard.

After entering a personal identification number (PIN), the customer selects the transaction desired and, by entering dollar amounts and depressing the "yes" or "no" keys, completes the transaction. Any two denominations of bills are dispensed in quantities up to 30.

The RT 5000 ranges in price from $25,000 to $40,000; $32,000 is the cost of a typical system. Lease rates range from $860/mo to $1,400/mo on a one-year contract, according to the spokesman.

Initial deliveries will begin in the second quarter of 1977, he said from company headquarters in Detroit, Mich. 48232.

ASC Unit Corrects For Satellite Delays

GERMANTOWN, Md. – The Satellite Delay Compensation Unit (SDCU) from American Satellite Corp. (ASC) is said to compensate for propagation delay in satellite data communications.

When a satellite circuit is used for data transmission at rates over 2,400 bit/sec under Automatic Repeat Request Stop-and-Wait line control such as with IBM's Bisync or Hasp Multileaving, the loss in efficiency is encountered, ASC said.

The SDCU is placed between a user's terminal equipment and modem. The unit is compatible with the terminal through a standard RS-232 interface and emulates the remote equipment in its response, according to an ASC spokesman.

Restructures Data Blocks

Internally, the SDCU restructures the data blocks to be transmitted for efficient transmission over the satellite link, he said.

At the remote end, the data blocks are restored to their original formats for presentation to the terminal. Consequently, ASC claimed, the SDCU will allow throughput which is limited primarily by the basic transmission rate of the line and by the capability of the terminal to utilize the line.

The domestic satellite communications company has not yet decided on a price for the unit or if there should be a charge at all for users of ASC facilities, the spokesman noted from ASC headquarters at 20300 Century Blvd., Germantown, Md. 20767.

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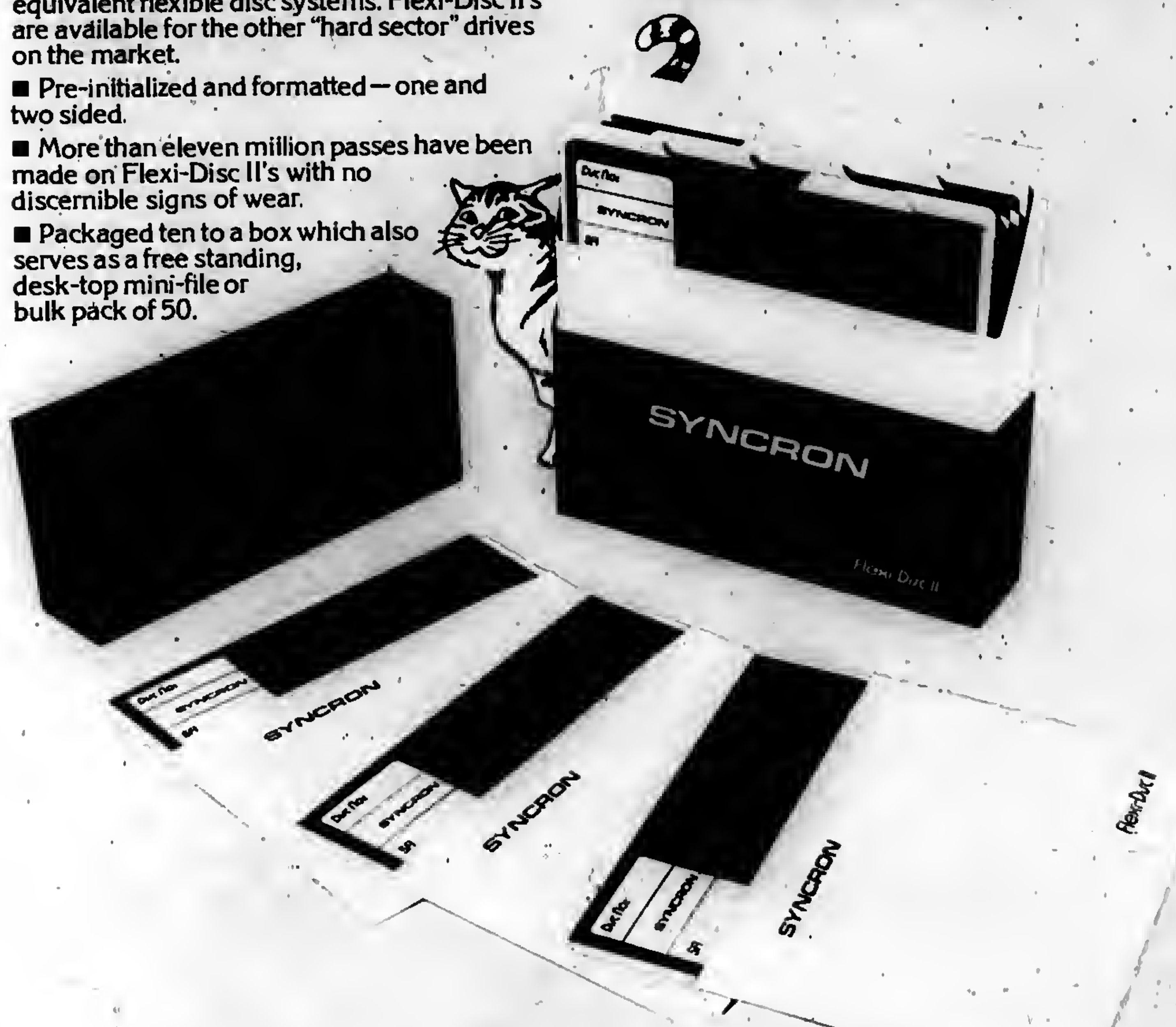

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TRW Has Modular Units For Bank Transaction Systems

LOS ANGELES – TRW introduced four modular products that reportedly expand a financial institution's options in setting up teller windows to handle specific types of transactions.

The products include a microprocessor-based CRT inquiry terminal, a passbook print station that can be shared by up to eight tellers, a customer-operated inquiry terminal and an alphanumeric typewriter keyboard for on-line inquiry and updating functions.

The modular devices are controlled by TRW's programmable communications terminal processor, which interfaces an institution's transaction-processing system with all CPUs utilized in the institution's data centers, according to TRW.

The Model 510 micro-based CRT terminal features a 480-character display in a 13-line format with 40 char./line plus a 512-character buffer, the company said.

The Model 510 can be combined with any TRW teller terminal to display on-line customer account information such as balances, holds and cautions.

One or two of the alphanumeric typewriter keyboards can be linked to a single CRT for input and inquiry to a central information file, including on-line name and address updates and other maintenance routines, TRW said.

TRW's Model 810 passbook print station can be used in combination with the firm's banking and statement savings terminals or the Model 510 CRT terminal, the company noted.

The Model 810 prints on standard passbooks as well as inserted documents such as checks, money orders and teller slips; it can be shared by up to four terminals serving eight tellers, prints at 30 char./sec and features end-of-form sensing and alert, centerfold skip and an error light, TRW said.

Entry of a customer account number or teller identity number can be required for accuracy and security when the printer is shared, the company noted.

Also introduced was the customer-operated inquiry terminal, which TRW said is about the size of a telephone. It can be placed in bank lobbies to allow customers access to savings, checking or NOW account information.

Information is displayed on the inquiry terminal on an eight-digit display; two models are available, with one incorporating a magnetic card reader.

The price of a Model 510 CRT inquiry terminal with one alphanumeric keyboard is $2,450. The Model 810 passbook print station varies in price according to the number of tellers supported and starts at $3,950, according to a TRW spokesman.

The price of a TRW customer-operated inquiry terminal begins at $385, according to the company at Suite 620, 9841 Airport Blvd., Los Angeles, Calif. 90009.

Big Costs Plague Small Users

(Continued from Page 29)

Time-sharing data transfer rates are limited by the input capabilities of the user, so terminals operate in the range of 100- to 1,200 bit/sec.

Holding times are long – typically five minutes to 20 minutes – "on a per-user basis; computer utilization is very low and computing charges build up slowly; therefore, communications charges dominate much more than in the nonreal-time case," Curran pointed out.

The notion of computers as message switchers grew out of the file-sharing experience of time-sharing and the capabilities of sophisticated networks like the Advanced Research Projects Agency Network (Arpa net).

Stock exchange, police information and transportation reservation systems make use of the flexibility provided by message switching in addressing capabilities, in storage and presentation format and in its adaptation to different terminal types, Curran explained.

The effect of message switching on telecommunications networks has been small so far, he said. Terminals here also operate in the range of 100- to 1,200 bit/sec, and holding times vary from one minute to three minutes.

"Thus they impose no more drastic traffic loads than does time-sharing," Curran stated.

Transaction Services

"We are now experiencing a large increase in transaction-type services," Curran said, noting these services range from point-of-sale outlets in large retail stores through simple credit-checking systems in small sales outlets to environmental monitors in remote locations.

"Dramatic" effects result from the geographic spread of data services and the traffic-handling requirements of the networks since the transactions may involve only a few hundred bits of information, but must be completed in a very few seconds, Curran said.

Data transfer rates range from 100- to 2,400 bit/sec. Holding times for inquiry response applications are 10 seconds to 40 seconds while those for data collection activities are one minute to over eight minutes, he added.

Four Classes of Facilities

In responding to the needs of all of these teleprocessing users, telecommunications carriers have developed four classes of facilities, according to Curran.

These include "leased-line – suitable for a user with very large quantities of data to transmit; telephone network – suitable where ubiquity is essential or where usage for data is low; circuit-switched – suitable when data communications approaches continuous use of the bandwidth for the duration of the call; and packet-switched – particularly suitable for bandwidth not continuously used for the duration of the call.

"The optimum choice between these offerings is not simple," Curran told the FCC. "No single solution adequately caters to all user needs.

"We shall require a mixture of private-line, circuit-switched and packet-switched facilities for the foreseeable future," he predicted.

The availability of these options has significantly reduced the cost of intercity transmission and improved performance at the same time, Curran said.

"The introduction of digital satellites will further reduce the cost of intercity traffic," but will probably have little effect on costs for "casual users in the smaller cities," he added.

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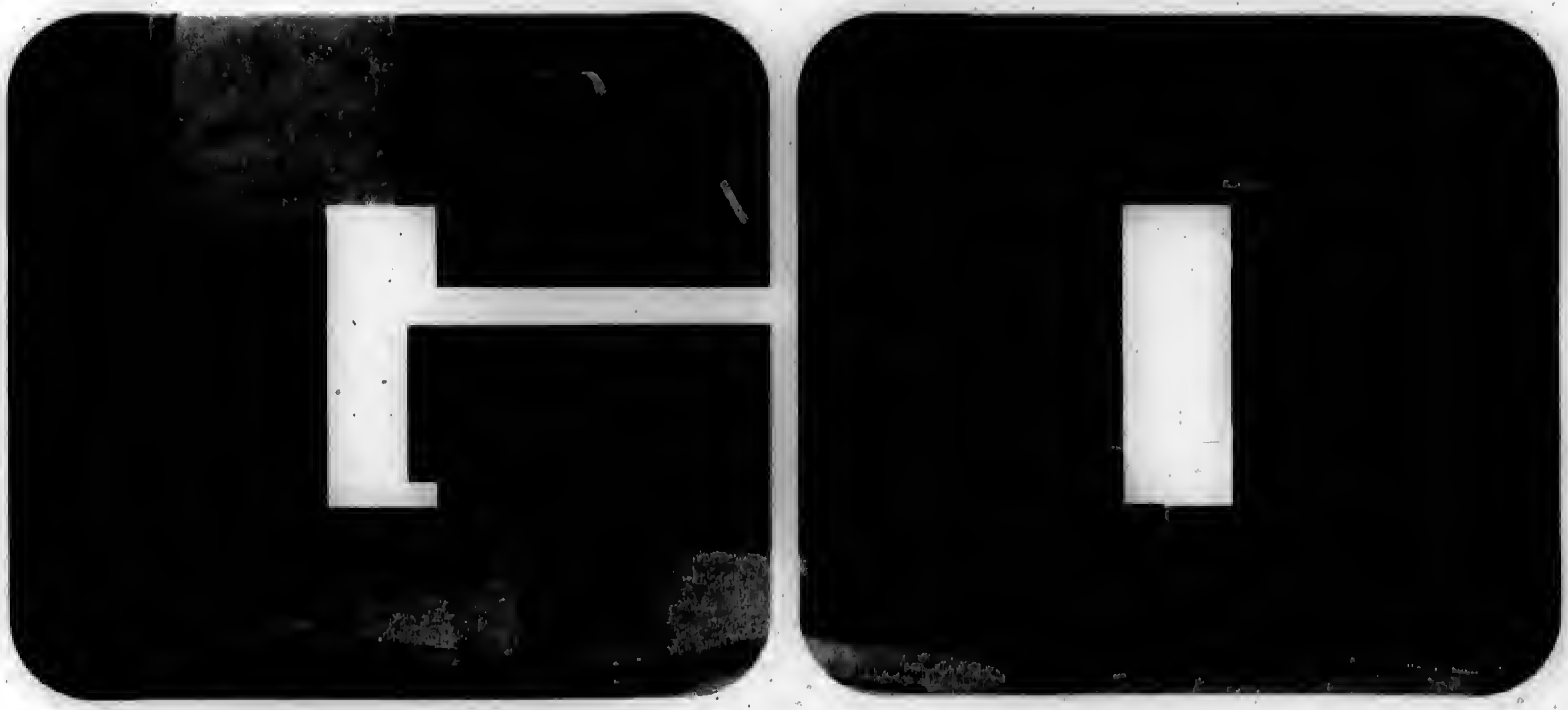

Informer R-301 CRT Designed For Use on Factory Floors

LOS ANGELES – A small, heavy-duty CRT/keyboard display terminal designed for factory floor environments has been introduced by Informer, Inc.

Informer Model R-301

The Model R-301 industrial rack-mounted terminal is aimed at machine control or factory data collection and transmission applications, according to an Informer spokesman.

Each R-301 terminal provides the standard keyboard configuration, but with keys spaced slightly closer together for use by factory personnel in a "hunt-and-peck" data entry manner, he said.

The keyboard is located on the side of the 5-1/2-in. CRT and is situated behind a hinged Plexiglass door to prevent accidental data entry.

The R-301 CRT screen has a glare reduction mask and displays up to 512 characters in 16 lines of 32 char./line, the spokesman noted, adding the unit has a standard RS-232 interface and operates at any data rate from 110- to 9,600 bit/sec in both half- and full-duplex modes.

The device is capable of operating on normal brownout voltage levels and can be installed in standard 19-in. computer racks or other machine cabinetry, he said.

The Model R-301 terminal is priced at $1,890. Informer is at 8332 Osage Ave., Los Angeles, Calif. 90045.

Terminal Transactions

Megatek 6014 Offers Upgrade To Users of Tektronix Plot 10

SAN DIEGO – Designed as an upward-compatible unit to the Tektronix, Inc. 4014, Megatek Corp.'s Megraphic 6014 graphics CRT terminal system enables Tektronix Plot 10 users to add dynamic vector refresh to their existing applications software, Megatek said.

The Megraphic 6014 is fully compatible with all Tektronix Terminal Control System (TCS) software and can directly replace any existing Tektronix 4014 terminal, the vendor added.

It is an intelligent refresh terminal that can be upgraded into a stand-alone system, Megatek said. The basic configuration includes e Data General Corp. (DG) Nova 3 general-purpose CPU with 8K 16-bit words of 700 nsec memory; a 17-in. monitor; Megatek's proprietary MG 752 graphic processor; and an Ascii keyboard with joystick, the company ssid.

The system also comes with an RS-232 interface, a table with an equipment rack and Megatek's 4014 emulator and Enhanced Dynamic Software package. The emulator, the firm noted, enables the CPU to interpret TCS Plot 10 commands and display them in refresh.

System options include a large CRT, memory up to 128K words, floppy- and hard-disk peripherals, data tablet/digitizer and plotter.

Because selective changes can be made in the CRT terminal, communications requirements with the host are reduced, leaving more CPU time for problem solving, Megatek said.

The DG Nova 3 is also available as a general-purpose machine with full programmer console features and ready access to all CPU and I/O functions.

Depending upon configuration, the Megraphic 6014 sells for about $16,000. Megatek is at 1055 Shafter St., San Diego, Calif. 92106.

Megatek Megraphic 6014

Telco Booster Helps Signals

GLEN COVE, N.Y. – Telco Products Corp. has a base station, preamplifier and back-lit "On-the-Air" sign it said boosts weak communications signals up to 25 db.

The Base Booster also reduces strong signals to -4 db and will sense when the transceiver is keyed, switching the preamplifier off during transmission and lighting the "On-the-Air" sign, Telco said.

The Base Booster costs $59.95, Telco said from 44 Seacliff Ave., Glen Cove, N.Y. 11542.

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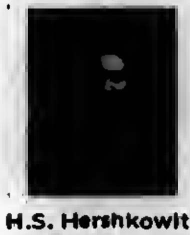

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CON FIGURE A WINNER

Data Communications Network Configurations
A Computerworld Special Report
November 29, 1976

Bell Phone Net Still Mainstay of Data Communications

By Fonnie H. Reagan
Special to Computerworld

During the past five years, many innovative communications services have been announced and made available to the computer user for transmitting data among his places of business. However, the public telephone network and leased, voice-grade, terrestrial lines remain the mainstay of data communications links.

Private telegraph-grade lines:	**12%**
Private voice-grade lines:	**74%**
Private wideband lines:	**11%**
DDD (public telephone network):	**47%**
In-Wats:	**14%**
Out-Wats:	**26%**

Figure 1. Summary of Communications Facilities Usage.

In a survey made by Datapro Research Corp. in late 1975, a total of 444 users responded with communications line usage and/or rating information. One of the questions asked what facilities were used. A summary of the results (Figure 1) shows the pattern of usage in percentage of the total number of users responding.

In the survey, users were also asked to rate the services they used. The pattern of carriers supplying services to the 444 users responding was as shown in Figure 2 and the ratings given to individual services by these users are summarized in Figure 3.

The remainder of this article is devoted to a discussion of the public telephone network and private voice-grade lines as provided by the Bell System, because these are by far the most commonly used facilities.

The first element in Bell's Direct Distance Dialing (DDD) network connects subscriber stations (telephones) via a station loop to their serving central office, or end office. Multiple end offices in the same city are connected by interoffice trunks.

When different cities are involved, the call is passed from an end office via a toll connecting trunk to a "toll office" via an intertoll trunk. From there the call is routed to another "toll office." Then the call is forwarded via an end office in that area,

The intertoll trunking forms an elaborate and extensive nationwide switching hierarchy. Typically, there are four geographically separate levels of switching making up the toll office arrangements: Toll, Primary, Sectional and Regional centers, which are also referred to as Class 4, 3, 2 and 1 offices. (The end office is referred to as a Class 5 center.)

Calls proceed up the hierarchy until a path is found toward the destination toll center. Shunts, called high usage trunks, are established where large interoffice traffic flows warrant. They expedite call completion and relieve network congestion.

AT&T/Bell System: 432 responses.

Other telephone companies: 70 responses.

MCI: 13 responses.

Southern Pacific Communications: 5 responses.

Western Union: 34 responses.

The responses total to more than the 444 users because many used services from more than one carrier.

Figure 2. Number of Respondents Supplied Each Service.

	Number of Responses	Ease of Installation*	Reliability of Operation	Quickness to Troubleshoot and Correct Problems*
Telephone network				
AT&T/Bell System	33	3.2	3.1	2.6
Other telephone companies	10	2.7	2.5	1.6
Private voice-grade lines				
AT&T/Bell System	154	3.2	3.1	2.6
Other telephone companies	24	2.4	2.8	2.0
MCI	13	3.0	3.2	2.9
SPCC	5	2.2	3.2	3.0
Western Union	11	2.3	2.4	2.0

**Weighted averages, based on a scale of 4 for excellent, 3 for good, 2 for fair and 1 for poor.*

Figure 3. User Ratings of Carrier Facilities.

The many possible variations in call routing have been a speed-limiting factor in the use of the DDD network for data transmission. Variations in circuit characteristics present with the different call paths prevent modem designers from taking advantage of fixed circuit characteristics to obtain reliable high-speed transmission. Different through-network delays, interfacing between successive trunks, varying points of amplication and like factors also add to variations between calls.

Modems must be capable of operating over a typical or average path, which will generally limit operation to a lower bit rate than private line channels. Nevertheless, transmission at 4,800 bit/sec is for many users a standard for day-to-day operations on the switched network. The Bell System itself offers a modem, the Model 209, for use on the DDD network at 4,800 bit/sec.

A second limiting factor of the DDD network is that it is constrained to half-duplex operations for bit rates of 2,000 bit/sec and up. The local loop is two-wire, but this is interfaced to a four-wire transmission path via a device called a hybrid. While the transmission path can carry data both ways at once, the two different signals could not survive the hybrids and local loops. This applies to present modem technology at 2,000 bit/sec and up.

Lower-speed modems such as the Bell 100 series commonly operate full-duplex over the switched network. At least one independent manufacturer, Vadic, offers a 1,200 bit/sec unit which can operate full-duplex on two-wire service.

Half-duplex operation places another restriction on DDD performance. A typical half-duplex procedure involves sending a block of data, awaiting the acknowledgement of the block and sending the next block.

In the DDD network the time to reverse transmission direction, or "line turnaround," may be as much as 0.2 sec. Two such turnarounds occur per block, so 0.4 sec of delay is incurred.

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On National, International Scale

New Family of Standards Being Developed

By Ira W. Cotton
Special to Computerworld

The past few years have been ones of significant new developments in standards for computer networking, although these developments have had little effect on users yet. An entirely new family of data communications standards is being developed and users should begin to feel their effects over the next few years.

The new standards being developed include replacements for such widely accepted standards as RS-232 at the electrical level and binary synchronous link control, as well as standards for areas not previously covered, such as packet switching.

These standards are being developed both on a national and international scale by such groups as the American National Standards Institute (Ansi), the Electronics Industry Association (EIA), the International Standards Organization (ISO) and the International Telegraph and Telephone Consultative Committee (CCITT), with considerable vendor participation. Most of these standards will be adopted for mandatory use within the Federal government by the National Bureau of Standards (NBS) and the National Communications System (NCS).

Data communications is an area of worldwide concern. The development of national standards in data communications is paced by the development of international standards. National options may be added when an international standard is adopted nationally, but it is highly undesirable (and quite rare) for a totally incompatible national standard to be adopted.

Signaling, Call Establishment

With the data networks of the future expected to be digital from end to end, standards are being developed to interface terminals to such networks. This includes replacement for RS-232, as well as the addition of a signaling scheme to initiate and terminate calls (replacing manual dialing). Even now physical connectors are being standardized.

In the U.S., the EIA is the focus of standards activities in the electrical and functional characteristics of interfaces. The designated temporary name for its new specification has been RS-XYZ, which uses a new 37-pin connector and which will provide superior performance to RS-232.

Internationally, CCITT Recommendation X.21 adds a level of digital signaling above the electrical specifications to provide a means for synchronous terminals to initiate calls, exchange call progress signals, transmit data and terminate calls on new public data networks. The electrical specifications in X.21 are a functional subset of RS-XYZ and a new 15-pin connector is specified. This recommendation is under consideration for adoption as Ansi and federal standards.

At the link control level, ISO has been struggling over the past few years to complete all the details of a new, bit-oriented High-level Data Link Control Procedures (HDLC). The American version of this procedure is called the Advanced Data Communications Control Procedure (ADCCP).

So far international agreement has been achieved for both the frame structure and the elements of procedure (definition of the command and response repertoire). International arguments are still going on

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This special report was prepared under the direction of CW Deputy Editor Ronald A. Frank. Cover art by Henry Fling.

'Packetizing' Avoided

Value-Added Net Serves About 105 Host Mainframes

By La Roy Tymes
Special to Computerworld

Tymnet is Tymshare, Inc.'s international value-added network consisting of about 200 nodes interconnected by leased lines. It serves about 105 host computers made by 10 different manufacturers. It is designed primarily for the low-speed interactive terminal (120 char./sec or less), but also supports remote job entry and computer-to-computer file transfer.

It was first brought up as a small network of 30 nodes In November 1971 and has been in continuous operation since then. It was first designed to interface low-speed full-duplex Ascii devices to the SDS 940. It has been expanded and enhanced to interface almost any device.

Tymnet is not a packet-switched network. Packet switching was rejected because of its inefficiency in handling small units of information. Also, people, terminals and interactive time-sharing systems do not naturally communicate in terms of packets; they communicate with character streams. "Packetizing" the data before transmission to reduce the cost of packet switching is an added complexity and irritant to both user and host computer.

When a user comes on Tymnet, he identifies his terminal type, gives his name and password and possibly other information. This information is sent to the network supervisor, a central program which controls the network.

The supervisor checks the password, the desired host and other conditions to see if conditions are appropriate for a log-in. If they are, the supervisor selects the optimal path through the network and builds a virtual circuit.

A virtual circuit is a full-duplex character path between the user and a port on the desired host. It is represented by table entries in the nodes through which the circuit passes.

Between any two nodes, the data for circuits passing between those two nodes is statistically multiplexed to keep bandwidth requirements to a minimum. In a character-at-a-time mode of operation, this is several times more efficient than packet switching.

We chose a centrally controlled network rather than distributed control for several reasons:

- The nodes can be made smaller, therefore cheaper.
- The supervisor can always select the optimal path for any user at any instant, since all global information is in one spot.
- Reaction to network trauma, such as line or node failure, is very fast. Diagnostics can be performed and new routing information can be generated in seconds.
- The supervisor has the name, password (in ciphered form) and other relevant information of every network user. It therefore can act as guardian for the net and the hosts on the net, deciding who can log into what and under what conditions.
- The supervisor is a convenient place to gather accounting and diagnostic information.

The one drawback to a centrally controlled network of this magnitude is the need for a supervisor of corresponding complexity. It must operate hour after hour, day after day, handling tens of thousands of log-ins per day. It also must be totally automated, so crises can be handled quickly.

We normally maintain four supervisors, so if the one on control fails, one of the others can take over.

User Benefits

The first benefit to the typical customer is economy. It is rare for the usual customer to have sufficient traffic volume between two points to justify his own private leased line. Wats and other approaches can get quite expensive, especially when one has an international operation.

The second benefit arises when the customer, having developed his package, attempts to deliver it to the real world. He is assaulted by bisynchronous, SDLC, X.25, half- and full-duplex, synchronous and asynchronous, Ebcdic, Ascii and many other predatory creatures of the communications jungle. If he can make it through all that to the terminal, he finds there is not just one kind of terminal, there are hundreds of them, with more coming all the time.

Let us say he has developed his package talking to one kind of terminal hard-wired to his machine. Tymnet can simulate a number of those terminals and handle all the translations between those simulated terminals and the real world. The more sophisticated and ambitious customer can interface to our virtual terminal, a software construct which allows flexibility in talking to the ultimate real terminal, yet shields the application program from the infinite variations of real terminals.

The third benefit arises when the product is in the field and being delivered to end users on a regular basis. Ordering telephone lines, chasing down their failures, installing communication equipment and similar problems associated with a communications system is a specialized and nontrivial operation. It is one of those things that takes far more time and resources than at first seems reasonable. With an Interface to a network the customer can usually forget those problems.

> *'The one drawback to a centrally controlled network of this magnitude is the need for a supervisor of corresponding complexity.'*

Other services of Tymnet include an absolute time reference. The supervisor Is monitoring the National Bureau of Standards and can pass this time to any host. This avoids operator errors in entering the time when a system is brought up.

We provide user statistics, so our customer can get various profile data on his end users. We also provide all accounting data to assist in generating billing. We support all character sets, plus raw binary data, in all nodes. Every link between nodes has full error control and can accommodate anything short of line outage.

Since our system runs all the time, we can automatically log into and run jobs on any

(Continued on Page S/22)

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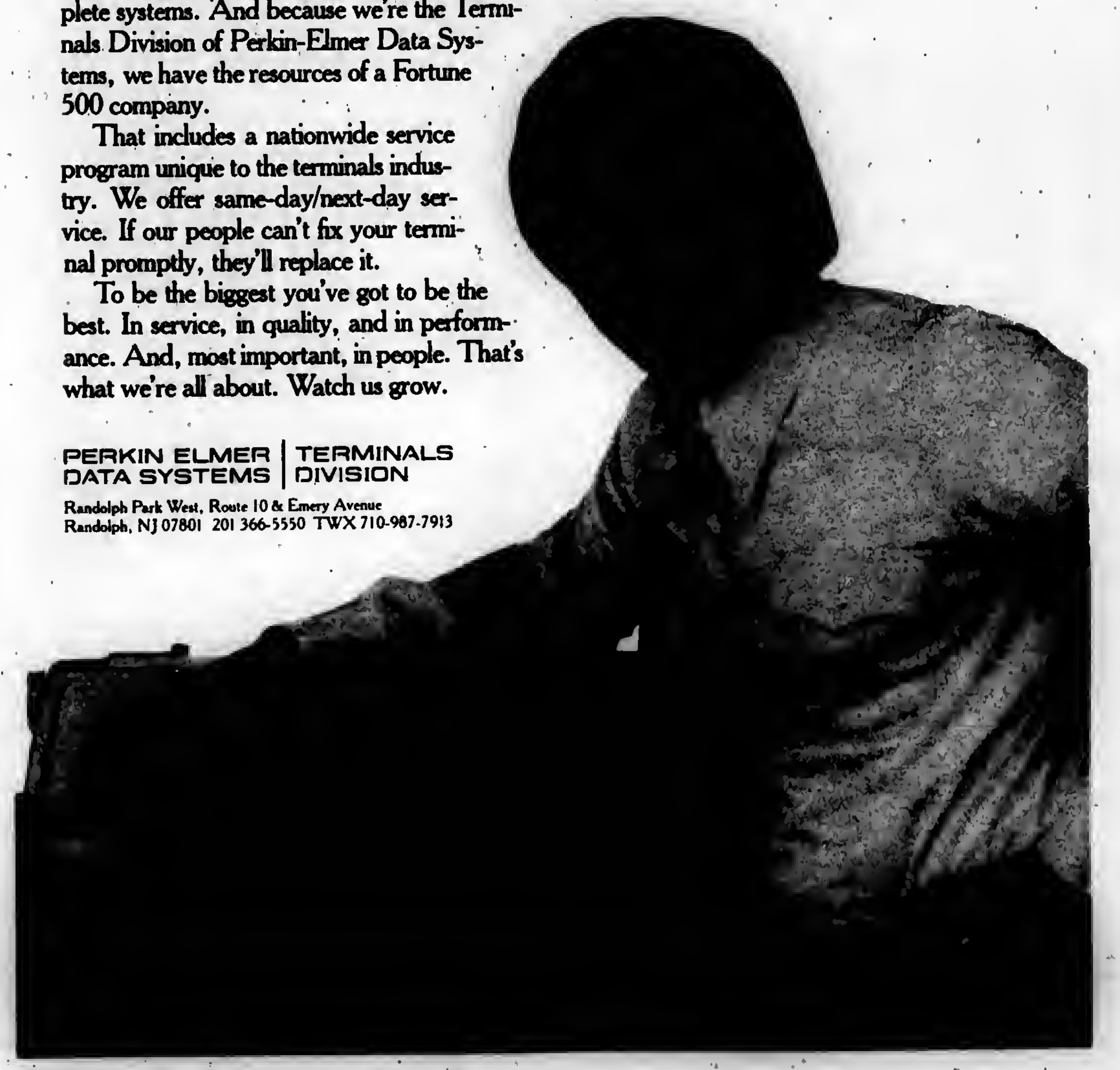

With a Multiplicity Available

Net Design Technology Key to Coping With Alternatives

By Howard Frank
Special to Computerworld

An important key to coping with the multiplicity of alternatives available for implementing a network is network design technology, which has advanced from primitive origins ony a few years ago to a major position in network planning during the 1976-1980 time frame.

Network analysis and design evolved from an art, based on rules-of-thumb and intuition to a pseudoscience, based on mathematical formulas derived from queueing theory and combinatorics, and back to an art, based on the iterative application by computer of human-suggested heuristic techniques.

Rudimentary network design was heavily dependent on simple rules garnered from experience. Rules such as "the average utilization of a communications line should not exceed 50% or 60%" were employed because designers had discovered that if such limits were substantially exceeded, excessive time delays often occurred. Such rules avoided the need for all but the most elementary time delay analyses.

A typical rule for simplifying the multidrop line design problems was "connect a new terminal to the nearest already constructed multidrop line with available capacity." Such a rule radically reduced the number of design alternatives that could be considered.

> *'The best approach to analysis is based on the "judicious" combination of analytic and simulation techniques. Many portions of the overall analysis problem have straightforward analytic solutions while others are exceptionally difficult and best treated by simulation.'*

Rules of this sort were often adequate for simple system development. As systems became more complex, however, the usefulness of intuition as an effective analysis and design tool diminished.

Simulation Next But Defective

Instead, simulation became the major design aid. Simulation was usually employed in the following manner:

- A design for the network was developed via manual, intultive techniques.
- A detailed computer-based simulation model for the network was developed and extensive simulations were performed.
- The designer searched the output of the simulations for bottlenecks, departures from expected operation and insights into design improvements.
- If time, money, and energy were left, the first three steps were repeated.

The simulation approach to design has several defects. The development of a detailed simulation program is costly and time-consuming, as is the operation of the program.

Searching computer output for potential system defects is, at best, risky; more often than not, the results are stacks of unread paper.

Moreover, unless the development and use of the model is carefully planned, its results may be statistically invalid.

Queuing Theory

The next step in the development of design aids was the attempted replacement of simulation as an analysis technique by analytic methods based on queueing theory.

The analytic methods were fast and relatively inexpensive to apply. In addition, the relative simplicity of the results often generated insight into the factors influencing overall system performance.

However, purely analytical approaches to analysis often led to intractable mathematical problems. These could only be solved by making assumptions not valid in the real world; until a system was actually built, there was no easy way to check the sensitivity of the system to the "solvability" assumptions.

The best current approach to analysis is based on the "judicious" combination of analytic and simulation techniques. Many portions of the overall analysis problem have straightforward analytic solutions while others are exceptionally difficult and best treated by simulation.

The combination of both approaches into a single unified analysis technique has been shown to lead to more accurate, less costly and more rapidly obtained solutions than those generated by "pure" analytic or simulation procedures.

Node Exchanges

The goal of the network optimization is to provide a "robust" network design which meets all design constraints and has the lowest possible cost. The most effective topological design techniques for computer-communication networks involved the heuristic application of a family of optimization procedures called "node" or "link" exchanges.

Exchange methods are search procedures which optimize network structure by sequentially changing small sections of a larger network. That is, small pieces of the

(Continued on Page S/28)

Net Configurations Require Maximum Planning

By M. Glen Looney
Special to Computerworld

In recent years high-volume, long-distance data communications users have been offered a number of alternatives to dedicated, leased-line service. These offerings are generally based on combining the traffic from a number of users to create sufficient volume to justify the cost of large capacity communications facilities. Packet switching, satellite channels and private microwave facilities are examples of these newer services.

Unfortunately, similar alternatives have not become widely available on "local loops" which are the necessary element for distributing large amounts of terminals to those points of transactions "where the action is." Local loops are even necessary if a company chooses to take advantage of the newer long-haul services. Whether the application is order entry, reservations or point-of-sale, the same considerations for local loops generally apply.

Advances in modem technology provide many cost-effective choices in line speed, dialed backup, etc. The cost for low-speed (300 bit/sec to 2,400 bit/sec) dedicated, multidrop local facilities, however, are still a function of mileage and drop charges; and these rates are usually set on an intrastate basis and may change at any time for any portion of a widely spread network.

Since, in general, the local loop component of any network is the least controllable element in budgeting for communications costs, as much planning as possible should be dedicated to configuring terminal networks.

In each state, the rates for mileage and drop charges are set by the utility commission of that state. Although the services offered by each telephone operating company are similar, the costs for the services vary widely. The two primary items in service fees are mileage charges and drop charges.

In some areas there is no mileage charge if a circuit goes between contiguous rate centers and has drops in each rate center. Some states charge a flat rate per airline mile of circuit run. Some states have relatively high drop charges; some states have no drop charges.

Thus the costing of the local loop portion of a network can have many variables. In order to understand what a company is faced with, it is advisable to consult with terminal and equipment vendors, other companies in the area who may have faced this problem previously, consultants who specialize in costing and planning networks and the local telephone company salesman and his technical people.

Preliminary discussions with telephone company personnel should be conducted even prior to deciding what the local network will look like. These early discussions to get the ground rules defined can have a definite effect on such network considerations as:

- How many circuits.
- How many drops per circuit.
- Where computers and concentrators

(Continued on Page S/23)

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New Communications Ideas Seen 'More Scarce Today'

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. — Innovation in the computer communications industry has dropped dramatically in the last four years, despite the development of good quality data transmission networks, according to Vinton G. Cerf of the Information Processing Techniques Office at the Defense Department's Advanced Research Projects Agency and Alex Curran, president of Bell Northern Research, Inc.

Ideas for new telecommunications services are more scarce today than they were when communications facilities were inadequate, they told the Federal Communications Commission (FCC) at a planning conference here recently.

In light of this demoralized climate, Cerf and Curran urged the FCC to make regulatory decisions that will encourage and stimulate innovation in the industry.

The conference was a technical Information session on communications, sponsored by the American Federation of Information Processing Societies (Afips).

Since Afips takes a neutral position on policy matters, Cerf and Curran did not feel they could offer solutions to the regulatory dilemmas faced by the commissioners, they said.

Cerf and Curran did, however, advise the commission to ensure that a sufficient set of standards are created so the interconnection of prime services is feasible.

This would create a climate in which computing and carrier interests would profit from the installation of reliable facilities and broaden the base from which capital can be acquired in the hope of eliminating a potential constraint to the growth of the telecommunications industry.

ICCC Observations

Cerf's and Curran's contention that there is a lack of innovation in the field at present is based on observation of the International Conference on Computer Communication (ICCC) which held its first meeting here in 1972.

The future of computer communications looked bright then, they noted. One conference participant expressed ICCC's mood when he said, "during the 1970's, the revenue from machines conversing will surpass that of people conversing."

Only one of the 22 papers defining new, innovative computer-based communications services at that first conference "painted a restrained picture," Cerf and Curran noted, adding that even at the time its author was considered "a reactionary."

Then, "the realities of implementing distributed computing services" hit and the number of service papers at the 1974 ICCC dropped to 12, Cerf and Curran said.

Just three months ago, the 1976 ICCC met and only four papers described new telecommunications services.

These three ICCC's led Cerf and Curran to conclude there has been "a very gross underestimation of the difficulty of creating and maintaining large data bases."

In addition, "no significant progress has been made on designing and implementing systems by which authors may be paid a royalty for the use of information they have prepared" for a data base, they said.

Growing Slowly

Computer-assisted instruction is growing very slowly, Cerf and Curran noted. "Again, the start-up problems were grossly underestimated."

Some progress has been made in automating library service systems, but in most cases librarians trained in their protocols are needed to enable users to get at the information they contain, they said.

Finally, they concluded no home services have been developed. "The costs are clearly too high, except for dedicated hobbyists."

Computer communications technology "is being applied only in the business sphere where the major uses are applied to reduce the cost of existing functions," Cerf and Curran stated.

In part, because of their importance to the business sector, electronic funds transfer (EFT) systems, point-of-sale systems (POS) and electronic mail will be the chief areas of growth in telecommunications in the next decade, Cerf and Curran predicted.

But implementation of these fields will be slow and their communications impact will be small — only 7% of the size of voice communications in 1986.

Local access will continue to account for communications costs that are higher than they need be, and a great deal of capital will be required for terminals and mainframes, Cerf and Curran projected.

EFT Prospects Promising

Overall, the prospects for EFT systems look the brightest. By 1986, EFT systems traffic could reach 67.7×10^9 checks processed or 1.27 bit/year $\times 10^{14}$. The communications costs will be $175 million and 90% of this capital will be eaten up by local loop requirements, Cerf and Curran said.

About $450 million will be required for the terminals in such an expanded EFT system and additional computer installations will cost $150 million.

According to Cerf and Curran, the benefits of this EFT system will be as follows: annual communications revenues will be $42 million; annual computing revenues, $210 million; and the cost per check will be approximately half a cent.

> *'No significant progress has been made on designing and implementing systems by which authors may be paid a royalty for the use of information they have prepared.'*

A universal POS-EFT network, linking all banks and all retail outlets in the U.S. by 1986, would cost nearly $20 billion in telecommunications facilities and $80 billion in terminals and computing systems, Cerf and Curran predicted.

"The investments would generate annual telecommunications revenue of $5 billion and annual computing revenue of perhaps $20 billion exclusive of the costs of computing hardware, software and systems maintenance," they said.

The average cost of processing each transaction would be five cents and that figure would be too high for small retail stores, they added.

Electronic Mail Costly

Based on time-sharing plus word processing, electronic mail which can cost as much as $3 per message is too costly to be practical.

Before electronic mail becomes a real possibility, terminal rental, for example,

(Continued on Page S/28)

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Technical Control Facilities Can Extend Net Efficiency

By Boyce M. Adams
Special to Computerworld

Teleprocessing has grown up out of two distinct disciplines. On the one hand, DPers come to us from the computer industry, which did not always recognize the necessity for efficient data communications. On the other hand, the classical communicators come to us from a long tradition of Teletype and voice services activities, usually with little involvement in DP.

The merging of these two disciplines is not yet complete and the differences between them are apparent, not only in the organization of DP and communications departments, but also in the design of both the hardware and the software which is used.

This is perhaps not too surprising, since the marriage between computers and communications was preceded by a rather long engagement. During the courtship, the computer industry continued to develop its technology with little regard for the needs of the communicator while the communicator struggled to convert a domestic telephone network , which had been designed and optimized for voice communications into an effective instrument for use in the transmission of data.

Component Subdivision

The result is the subdivision of a total teleprocessing system into a number of components — mainframe, transmission control units, local modems, transmission links, distant modems, remote or local terminals and remote or local minicomputers.

The computer mainframe and the remote terminal represent the highly developed technology of the computer industry where users deal in sophisticated programming languages which simplify their task tremendously.

The transmission link represents the highly developed technology of the communicator, where information is dealt with in terms of electrical voltages and currents and where characteristics are described in terms of phase shift and frequency response, all engineering terms.

> *'It is therefore vital that the total system be separable into its component parts before any meaningful diagnosis of faults can begin.'*

The modem and the communications controller represent the link between these two technologies and together they perform an essential conversion from one discipline to another.

However, as DP professionals are too painfully aware, this multiplicity of disciplines and the resultant multiplicity of suppliers can develop into a nightmare when it comes to assigning responsibility for correcting malfunctions.

It is therefore vital that the total system be separable into its component parts before any meaningful diagnosis of faults can begin. It is a need that is answered by technical control centers (TCC), as Spectron Corp. calls its system, or network control systems, as other offerings are named.

The TCC provides that separability and is essential in any well-conceived plan to provide diagnostics for data communications. However, it need be only as complex as the needs and tastes of its users dictate.

Beginning with the simple requirement for shelves to hold modems, the need progresses rapidly to some reliable yet simple means to substitute good modems or lines for bad ones; and eventually to the necessity for adequate test facilities so that performance can be measured and technical difficulties resolved.

New Way Needed

Today's complex, remote data communications environment demands a new way of monitoring, diagnosing, compensating and correcting the diverse elements in such a network. And providing preventive maintenance services as well.

The need, one just now being realized as data communications networks mushroom in size and complexity, is for a simple, efficient way of assuring a DP installation that it is providing the required grade of communications services to its users.

It is not a simple task when you look at what goes into a large-scale data communications network.

TCC, however, make the job simpler by concentrating in a specially designed facility the centralized control to quickly and easily locate and diagnose problems anywhere in a network and restore service quickly to a remote site even when phone line or modem fails.

Problems Easily Identified

Problems are easily identified with a TCC because of the inherent flexibility which allows any line to be patched to any modem, and any modem to be patched to any port. It can be determined whether a problem lies in the telephone line, the data terminal, the transmission equipment, the front end, CPU, or perhaps an erring operator.

The TCC permits on-line checks to be performed with its test equipment which can pinpoint a malfunction with a minimum of disruption to the network.

Experienced data communications users find telephone lines usually do not just go down. Instead, they degrade. Since the TCC can diagnose this condition with its test equipment, it may be used to conduct routine line checks and thus help to avoid more serious problems later.

Similar testing procedures may be conducted to determine unacceptable high levels of noise on a line that causes distortion and inaccurate data transmission.

To carry out the technical control concept of centralized control, monitoring and testing, the facility must be located at the hub of the transmission network. Location at the hub provides access to the primary switching, multiplexing and control equipment and to the concentration of modems serving the communication lines to distant terminals.

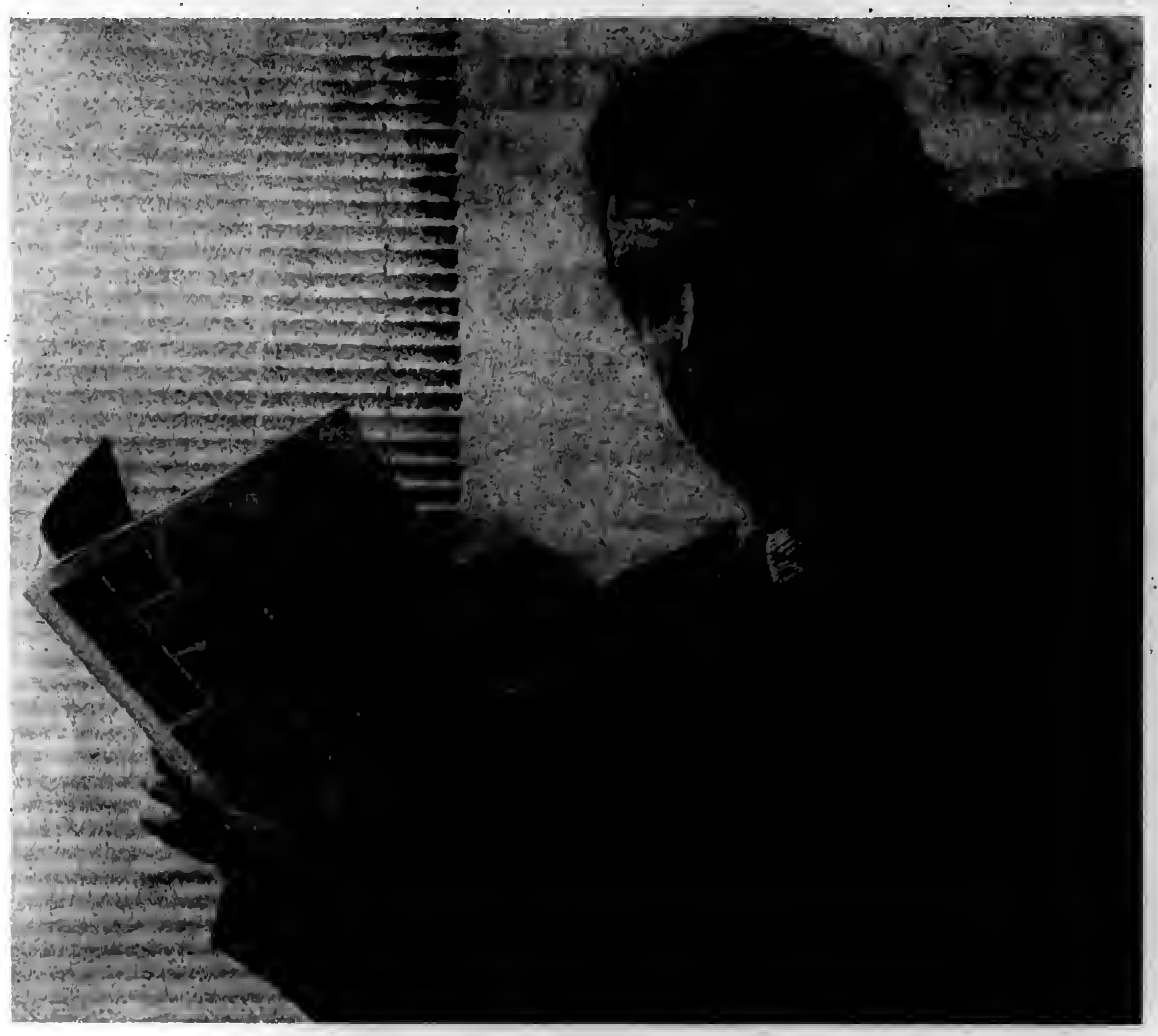
Importance of Proximity

The importance of this proximity to the major concentration of equipment — besides the obvious advantage of having the equipment accessible to technical control personnel — lies in the necessity for "bringing" the interfaces of equipment and lines to the technical control facility equipment racks or console.

This positioning of interfaces is the key to the patching and switching that enables the substitution of equipment to maintain or restore service and provides the circuit appearances for monitoring and testing.

The equipment racks of a well-designed

(Continued on Page S/27)



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Detach here, fold, and place in post-paid envelope attached through binding.

According to a Stanford Professor

FCC Must View Product as Integrated Services Pack

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. – The Federal Communications Commission (FCC) must learn to think of the telecommunications product as a package of integrated services for the nonprofessional DP user, Donald A. Dunn, professor of engineering/economic systems at Stanford University, told the commission at a planning conference here recently.

The "service package concept" is essential to the FCC's understanding of computer communications if its commissioners are to decide how to regulate the industry while permitting it to grow, Dunn suggested.

In addition, this notion of integrated services is the way for telecommunications because it makes user learning and system use costs affordable, he told those attending the conference organized by the American Federation of Information Processing Societies (Afips).

Dunn urged his audience to recognize that the structure of computer communications networks suggests a division of provider firms and their services into groups, some of which are already regulated to varying degrees.

These divisions exist independently of either the computer or the communications services involved and, therefore, don't require the FCC to determine which service is DP and which is communications, he said.

Four Divisions Identified

Dunn identified four divisions: providers of communication lines and providers of complete network services, both of which are regulated as underlying and resale carriers under the FCC; providers of computers and terminal equipment that lies outside the network interface and providers of complete information service packages that may include both communications and DP functions, neither of which are governed at present by the commission.

Competition to provide the complete information service package "is important to the future growth of the industry and to the development of a wide variety of services tailored to user needs," Dunn said.

Noting the present computer communications market encompasses about 500,000 terminals, the Stanford professor sees a potential for 50 million terminals, despite user learning costs and regulatory limitations which, he said, have and will continue to stunt this hybrid industry's growth.

Because the markets for these additional millions of terminals exist chiefly in businesses and homes where noncomputer professionals abound, Dunn favors automated, easy-to-use terminals over the standard variety that require extensive training to operate.

As terminal costs go down – they and not communication line prices are the expensive item from the user viewpoint, Dunn said – the computer communications field will grow, he predicted. However, this expansion will also depend on the availability of integrated telecommunications services, he added.

The core services in the telecommunications package will be message service, text editing, word processing and information retrieval of user files, Dunn said.

If they are really useful, additional specialized services such as news, bibliographic search, financial data and computation aids can be added to the core package, he noted.

Policies Hinder Growth

Some regulatory policies – like "low rates of return on capital and the assignment of long lives to capital equipment in determining depreciation allowances" – hurt the growth of telecommunications, according to Dunn.

In the short run, these particular policies minimize telephone rates, but they also make it difficult for the telephone companies to finance new communications equipment needed to go with computers and user terminals in a nationwide network, he added.

"These limitations on the growth of the carriers will have an effect on the computer communication industry that is, however, not as great as might be expected because of the relatively low utilization of lines by data users as compared with voice users and the possibility of using the same line for alternate data and voice," Dunn said.

However, the FCC's approach to regulation – dividing the telecommunications industry into its DP and communications components – was of greater concern to Dunn.

Dunn's four-group division of industry providers doesn't worry about the service being offered. Instead, the model concentrates on the notion that the network configuration is independent of the service provided.

Dunn suggested the FCC has already acknowledged the natural boundaries between the providers of communications lines, complete network services, computers and terminal equipment and complete information service packages.

AT&T's telephone service and Satellite Business Systems' integrated services to business firms are examples of firms and services which cut across all these boundaries, he said.

Telenet's packet-switched network and Lockheed's bibliographic search, however, each offer only one level of service: a communication link and an information service package complete with the necessary software, respectively.

Western Union's Telex service, Tymshare's time-shared computing and Arinc's integrated services to the airline industry all provide everything but the communications links, according to Dunn.

'Computer Inquiry' Rule

The FCC's "Computer Inquiry" rule that requires DP services to be provided by carriers through separate affiliates limits the growth of carriers, but doesn't

(Continued on Page S/9)

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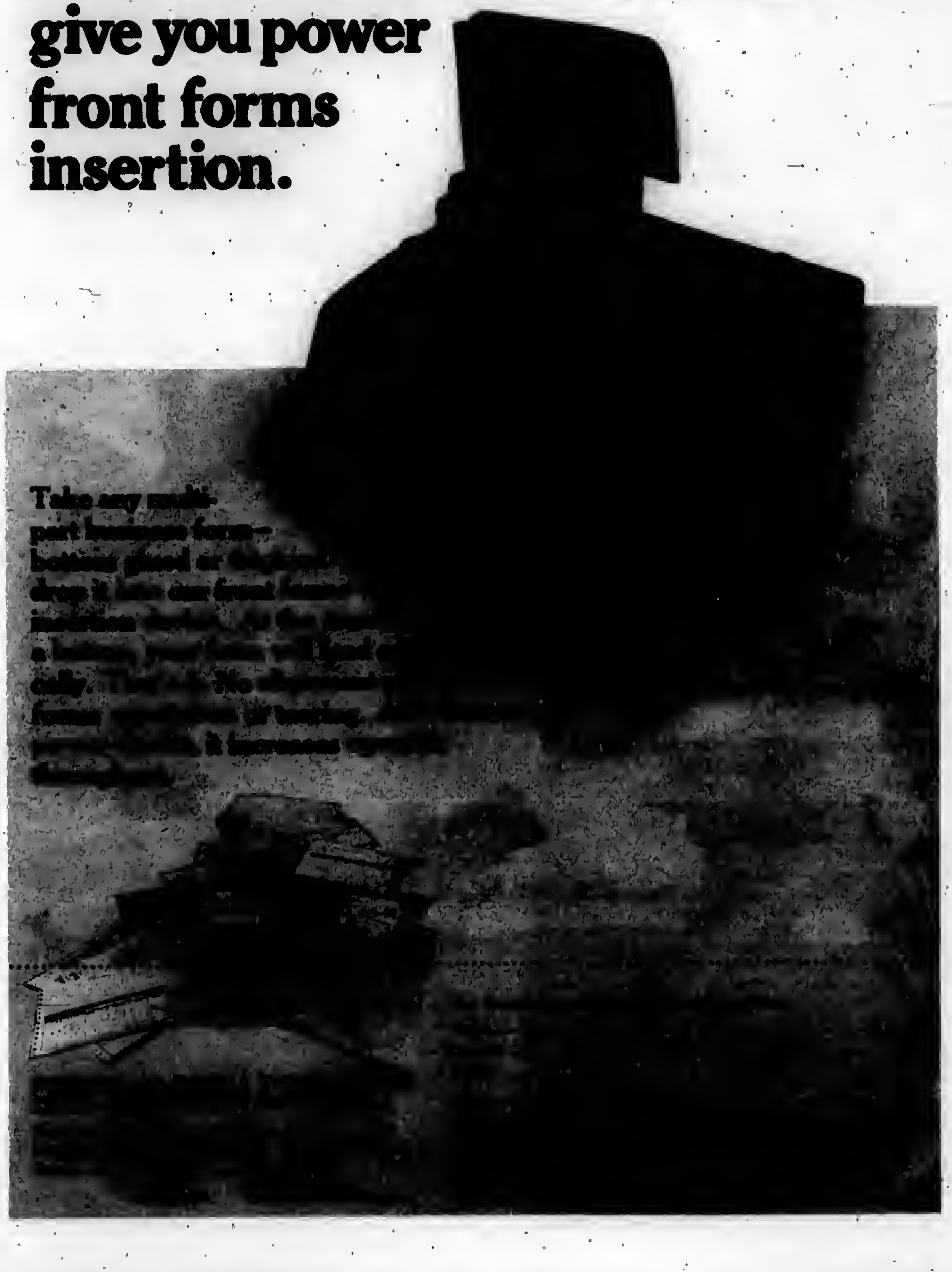

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Bell Phone Net Remains Mainstay of Communications

(Continued from Page S/2)

One could send 100 characters in this time using a 2,000 bit/sec Model 201A modem. If you are sending one 80-character record per block, the transmitting efficiency is something on the order of only 44%.

The long turnaround is mostly due to the time required to turn off the echo suppressors, which act to isolate the return path and block signal "leakage" through the hybrids. The echo suppressor for the return path must be turned off to allow signal flow in the other direction.

Dialing Delays

Yet another drawback for use of the DDD network for data is the call establishment delay. The first component of this is that of dialing. The delay between pickup and getting the dial tone ranges from 100 msec to 500 msec. Thereafter, automatic calling units can "Dial" at the rate of 10 pulse/sec plus a 600 msec pause between digits for a rotary-dial line.

For a tone-dialed line (Touch-Tone), the rate would be 10 digit/sec. A number such as 609-764-0100, then, would take 12.7 sec to pulse dial or 1 sec to tone dial, plus the delay to get the dial tone.

Once the call has been dialed, there is a delay while the switching hierarchy completes the connection. According to Bell, the average delay is about 11 sec for 0-to 180 miles; 16 sec for 180 to 275 miles and 18 sec for 725- to 2,900 miles. Variance for each group is 5- to 7 sec.

In late 1975, AT&T announced a new signaling structure called Common Channel Interoffice Signaling (CCIS). With CCIS the information needed to establish and route calls will be carried on a separate data link from the call circuit. This will allow faster signaling and lead to a reduction in call setup time to about 2 sec, according to AT&T. CCIS is a feature of AT&T's new No. 4 Electronic Switching System (ESS) now in service in Chicago, Kansas City, Jacksonville and Dallas. By 1978, AT&T expects to have 20 such machines in operation.

Finally, the DDD network is usually thought of as being a fountainhead of data errors due to passage of the signal through switching centers and over variable routing. In the most recent study (1970) of switched network data performance, the results showed an order of magnitude improvement over the prior (1959) study.

The 1970 study suggested that some 95% of 10,000-bit blocks would get through error-free at 2,000 bit/sec and 90% at 3,600 bit/sec. Shorter blocks, which are more common, result in better performance. (Nothing should be inferred about performance at 4,800 bit/sec, because such modems utilize a different modulation scheme and may perform comparably or better). An error detection and retransmission scheme can substantially reduce the residual error rate.

Private-line services have traditionally been offered in three principal categories. These are referred to as low-speed or narrowband, medium-speed or voice-grade, and wideband or broadband.

In analog systems, all such channels are derived using frequency division multiplexing (FDM). The carrier begins with "bread-and-butter" voice channels and combines 12 of them, via FDM, into a "group." In turn, five such groups are combined into a supergroup, the equivalent of 60 voice-grade channels.

Finally, 16 supergroups are combined into a line group, representing 960 voice-grade channels. (Such groupings, expressed in bandwidth, comprise wideband offerings.)

Low-speed offerings are obtained by using FDM to divide the voice channel into smaller channels.

There has been a steady trend away from the use of narrowband services for data communications. When one combines line cost with greater capacity, the voice channel is normally more cost-effective. The greater capacity also translates to faster response-time performance, an important factor in many applications.

Private line voice-grade channels are widely used for data communications. They may be arranged for two-point or multipoint service and are generally used at speeds up to 9,600 bit/sec.

In today's commercial practice, multipoint systems are generally constrained to 4,800 bit/sec. This is because of the "training" time needed for high-speed modem signaling.

In multipoint systems, only one remote terminal may have its modem carrier (transmitting signal) on at a time. If two or more were to be on, the mixture would be undecipherable by the computer.

Hence the usual line control procedure is to have the computer invite or poll each remote terminal in turn to transmit. A terminal recognizes its particular poll (address) and turns on its modem carrier. The computer's modem must now adjust itself or "train" to the terminal's carrier.

RTS/CTS Delay

The remote terminal waits through a fixed delay called the Request-to-Send/Clear-to-Send (RTS/CTS) delay for the computer's modem to train before it begins to send data. For modems at bit rates above 4,800 bit/sec, the effect of the training time on response time has thus far been too great to allow economic multipoint operations.

Codex recently introduced an interesting concept: 9,600 bit/sec from the computer and 4,800 bit/sec from the terminal. In the outbound direction the computer keeps its carrier on constantly, so the RTS/CTS delay is not a problem and the full 9,600 bit/sec can be effectively used.

However, for the most part, present limitations restrict 7,200 bit/sec and 9,600 bit/sec to two-point applications, typically for remote batch, remote job entry or data collection.

One interesting variation on the present ceiling rate of 9,600 bit/sec is the use of two voice channels to achieve 19.2 kbit/sec. Devices are available which will split a 19.2 kbit/sec bit stream into two 9,600 bit/sec streams and feed each into a separate voice channel. At the remote end the device combines the two signals again into the original 19.2 kbit/sec stream.

Communication circuits produce two major characteristic effects on a modem's carrier signal. They attenuate (reduce) the signal amplitude (intensity) as a function of carrier frequency and they delay the signal as a function of the signal frequency.

Conditioning is a process of changing a circuit's characteristics to the point that the attenuation and delay are within values manageable by the modem. These values will be a function of the modem's modulation and demodulation techniques and its operating bit rate.

The Bell System has traditionally pro-

(Continued on Page S/22)

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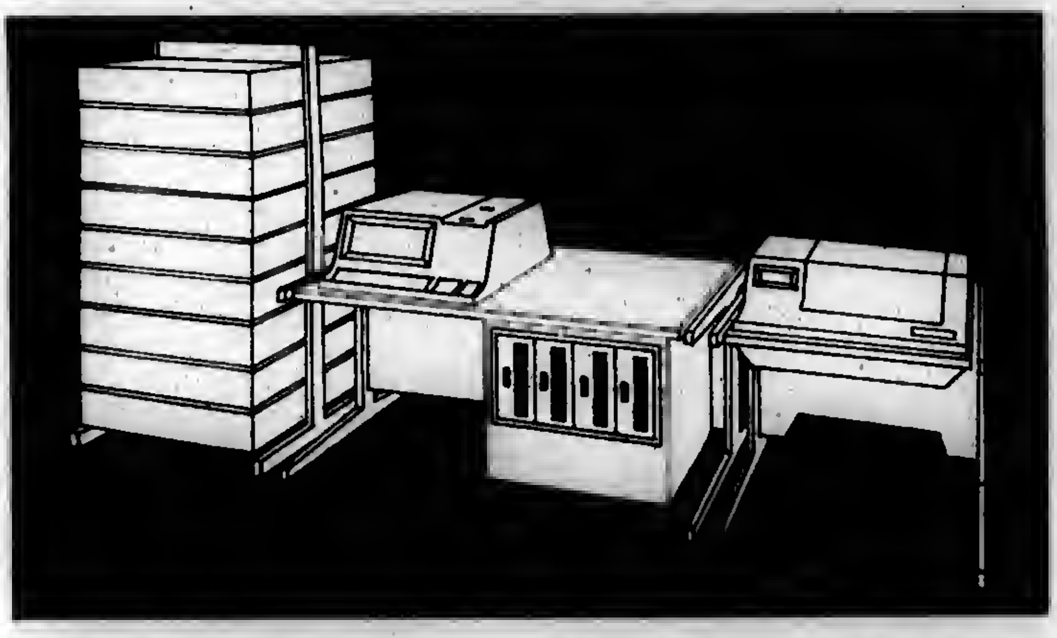


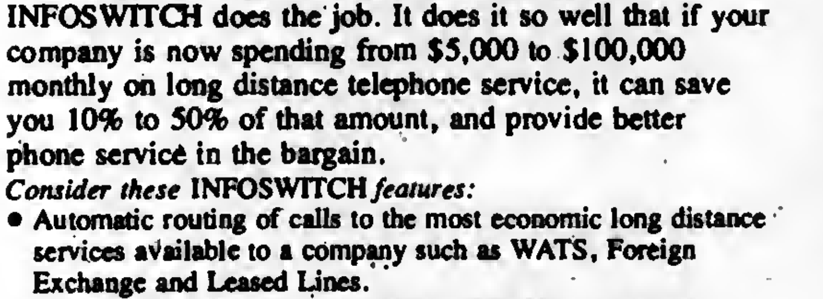
It's hard to beat the telephone for convenient, effective communications, which is one good reason why long distance telephone costs are rising sharply at most companies. It's also why Datapoint Corporation has created its new INFOSWITCH system, to let you continue to make extensive use of voice communications while enjoying an authentic management control over both long distance usage and costs.

Based on advanced computer and communications technology developed by Datapoint Corporation, INFOSWITCH does the job. It does it so well that if your company is now spending from $5,000 to $100,000 monthly on long distance telephone service, it can save you 10% to 50% of that amount, and provide better phone service in the bargain.

Consider these INFOSWITCH *features:*
- Automatic routing of calls to the most economic long distance services available to a company such as WATS, Foreign Exchange and Leased Lines.
- Automatic "packing" of available "flat rate" services to insure their maximum utilization through a multi-call holding procedure which automatically buffers waiting calls in overload situations until low cost service becomes available.
- Complete documentation and accounting information on *all* long distance calls including those routed through flat rate services, allowing charges for these calls to be billed back to individuals and departments on the basis of use.

These INFOSWITCH features generate substantial cost savings through improved utilization of the existing phone facilities leased by a company (in many cases the number of these facilities may be reduced) but that's not all. With INFOSWITCH's built-in programmed flexibility, many additional operational benefits may be obtained that will help companies get more from their long distance phone network for less. These include:
- Speed dialing numbers — special three digit numbers — for frequently called parties that speed up the dialing process, eliminate errors, and provide convenience.
- The ability to monitor line utilization by hour, day, week and month for analysis of usage patterns and corresponding optimization of service "mix."
- Caller identity numbers that restrict long distance phone usage to authorized users during both regular and "off hours."
- The ability to easily alter phone system parameters such as caller identity numbers and speed dialing numbers via INFOSWITCH's video display/keyboard to reflect changing user situations.
- Access to the company's long distance service facilities by employees at "remote" locations, such as their homes, from any tone dial telephone.

These are just some of the features, and savings, available to the long distance user with INFOSWITCH. Cost of a typical 13-trunk system is less than a band 5 WATS line. Users have the options of outright purchase or 1, 2, 3 or 5 year lease plans. For more information, give us a call. Contact the Datapoint sales office nearest you or call Steve James or Tom Anderson at (512) 690-7494.



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Network Accommodates the Needs of Different Users

By Jess W. Hall
Special to Computerworld

By utilizing contemporary technology and software developed in-house, Business Communications Sciences, Inc. (BCS) developed a communication network for Computerized Automotive Reporting Services, Inc. (Cars). Faced with the growing requirements of the automotive industry and the geographically dispersed locations involved with the network, BCS tailored two Honeywell 716 front-end systems (one for backup) to accept accounting, inventory control, leasing, payroll and warranty-type source data.

The communication system has been operational for two and one-half years and presently services 1,000 users. Although the software is accommodating 250 of the ASR 33-type terminals at speeds of 110-, 300- or 1,200 bit/sec, the primary input terminal is a modified version of the Sycor 340.

Operating at communication speeds of 1,200 bit/sec to 4,800 bit/sec, the modified Sycor 340 has performed well in this remote batch environment. Improvements above the ASR 33-type terminals have been a substantial reduction of customer keying errors by utilizing the terminal's self-check digits, document and batch balance capabilities and individual field editing.

Although the majority of the communications are attended, the terminal operates unattended at various times and will accept redial commands from the front end. Various line protocols are supported by both the terminal and the front end; however, the normal protocol is an IBM 2770-type with a few minor modifications.

Having been confronted with both geographically dispersed dealership locations and the rising cost of communication carrier facilities, BCS is utilizing the in-Wats network provided by AT&T. Through coordination with local Bell engineers, both a patch panel and a unique set of inter- and intraband rotary groups of in-Wats numbers are used to further reduce the communication cost. These costs were created by having concentrated areas of dealerships and yet having to provide services for remote and less dense areas with a minimum number of lines.

Annual Usage Logged

The communication system receives over 1.5 million incoming calls annually. However, since a transmission disposition message and any processed data that is available will be returned to the dealership on the same incoming phone call, the system logs an annual usage in excess of 30,000 hours. Considering that the transmission speeds are generally at 1,200 bit/sec, the number of characters transmitted annually, excluding control characters, exceeds 6.5 billion.

Obviously, security and data integrity are monitored extensively. The front-end software is designed to insure valid user and user-to-data control. This is accomplished through a master file, header/trailer masking and ID matching algorithms.

Data integrity, hardware (both terminal and system) and user fault coordination are monitored by two real-time devices. One of these devices is a Bell Dataspeed 40 located in the customer service department which receives all error code transmissions that are potentially user-type erors. Through this console, customer service representatives are informed of these problems and contact the dealerships to provide available aid.

Secondly, any incoming or outgoing transmission is logged by an on-line printer. This printout contains various data supplied by the transmission itself as well as items such as the physical telephone line number, number of characters, WAKS, NAKS, TTDs, the type of data being transmitted and the user ID. Through the on-line printer, systems operators monitor traffic and can trace any user through the system.

The communication system has provided dealerships with relative control over the system as it pertains to data requirements, without being on a rigid schedule. Yet it affords the Cars computer center the ability to maintain control of a large data base and scheduling of the host system for processing.

Hall is manager of communication sciences at BCS, Birmingham, Ala.

FCC Must See Product As Service Package

(Continued from Page S/7)

have to check the growth of telecommunications because unregulated suppliers can respond to this market, Dunn said.

In addition, he noted, the FCC's regulation of resale carriers — those that provide network services — need not inhibit the growth of computer communications, particularly since resale carriers that do not provide monopoly services won't have to form separate affiliates in order to offer DP.

A resale carrier like Telenet, for example, would not have to form a separate subsidiary to offer DP services over its network.

Further, while resale carriers fall under its jurisdiction, the FCC has, through the "resale-and-sharing" decision, opened the market for network services "to essentially any firm willing to operate as a resale carrier," he said.

The FCC's present regulations on the provision of computers and user terminal equipment as a part of DP services limit the actions of carriers, but they need not limit the growth of telecommunications, according to Dunn.

At the conclusion of his presentation, Dunn reiterated his concern for his group of providers offering complete information service packages. "Pressures are likely to develop soon to regulate providers of information service packages that may offer computer message services to users who obtain network services from resale carriers," he said.

"Such regulation would inhibit the growth of the industry and is not needed to protect the interests of users," he warned.

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Multipoint Net Diagnostics Should Be Reconsidered

By Steve Brauner
Special to Computerworld

Much has been written lately about diagnostic control systems for multipoint networks. After one sifts through buzzwords and vendor nomenclature, a standard set of control capability is left.

There is, however, a unique alternative. Before explaining it, however, let's review standard approaches.

A noninterfering "out-of-band" diagnostic channel, generally FSK, is created to pass commands from a central site to each addressable remote modem drop. A central site operator generally is given the ability to view the status of selected leads of the remote drop EIA interface.

He may also force selected loopbacks and interfering test patterns in order to perform error-rate analysis on specific line segments or hardware. Many systems have additional commands to isolate and turn off streaming modems and to check terminal power and modem power.

The Missing Element

What is critically missing from these systems is *transmission impairment analysis*. If the operations staff is truly responsible for circuit availability, it must have dynamic measurements relating to receiver level, s/n ratio, p-p phase jitter and amplitude distortion at *every* modem drop.

It is one thing to telemeter the status of a remote modem's signal quality lead. It is infinitely more valuable for an operator to know a circuit's inferior performance is due to excessive phase jitter.

Any high-speed modem, regardless of design implementation (i.e., analog, digital, discrete or LSI), must constantly perform transmission impairment analysis. That is, a modem dynamically compensates for changing power levels, phase jitter, noise and so forth.

If these tracking computations could be made available to the outside world, one would effectively have a tech control center at every modem location.

Value of Micro

However, it is not easy and sometimes impossible to extract such measurements from analog or digitally designed modems. But a modem which is microprocessor-based would readily have these calculations available in digital word format.

The Microprocessor 4800 from Paradyne uses a microprocessor slice, high-speed multiplier, data memory, coefficient memory, program memory and program address generators. This architecture allows the modem to be changed to any degree desired by simply changing instructions residing in the program memory and constants residing in the coefficient memory.

From the performance point of view, a programmed modem does not differ from any other well-designed implementation. However, the main benefits to the user are significant.

Most Important

Most important is the continuing on-line signal quality analysis the modem performs as its standard function. By measuring, processing and telemetering parameters such as filter tap weights, eye scatter and phase offset, it is possible to provide on-line indication of signal quality and line characteristics.

This capability can complement and to a great extent supplant conventional line-analyzing equipment. In addition to providing an estimate of jitter and noise, it is possible to indicate the approximate degree of delay and amplitude distortion on a line.

New Dimension

Each microprocessor-based modem in a multipoint network would constantly be tracking its own degree of jitter, noise and numerous other operating parameters. All of these readings are available in binary digital word format and therefore can be retrieved by a central site facility, adding a new dimension to multipoint network control.

> *'A smart modem . . . becomes the basis for automatic management and restoration of multipoint networks.'*

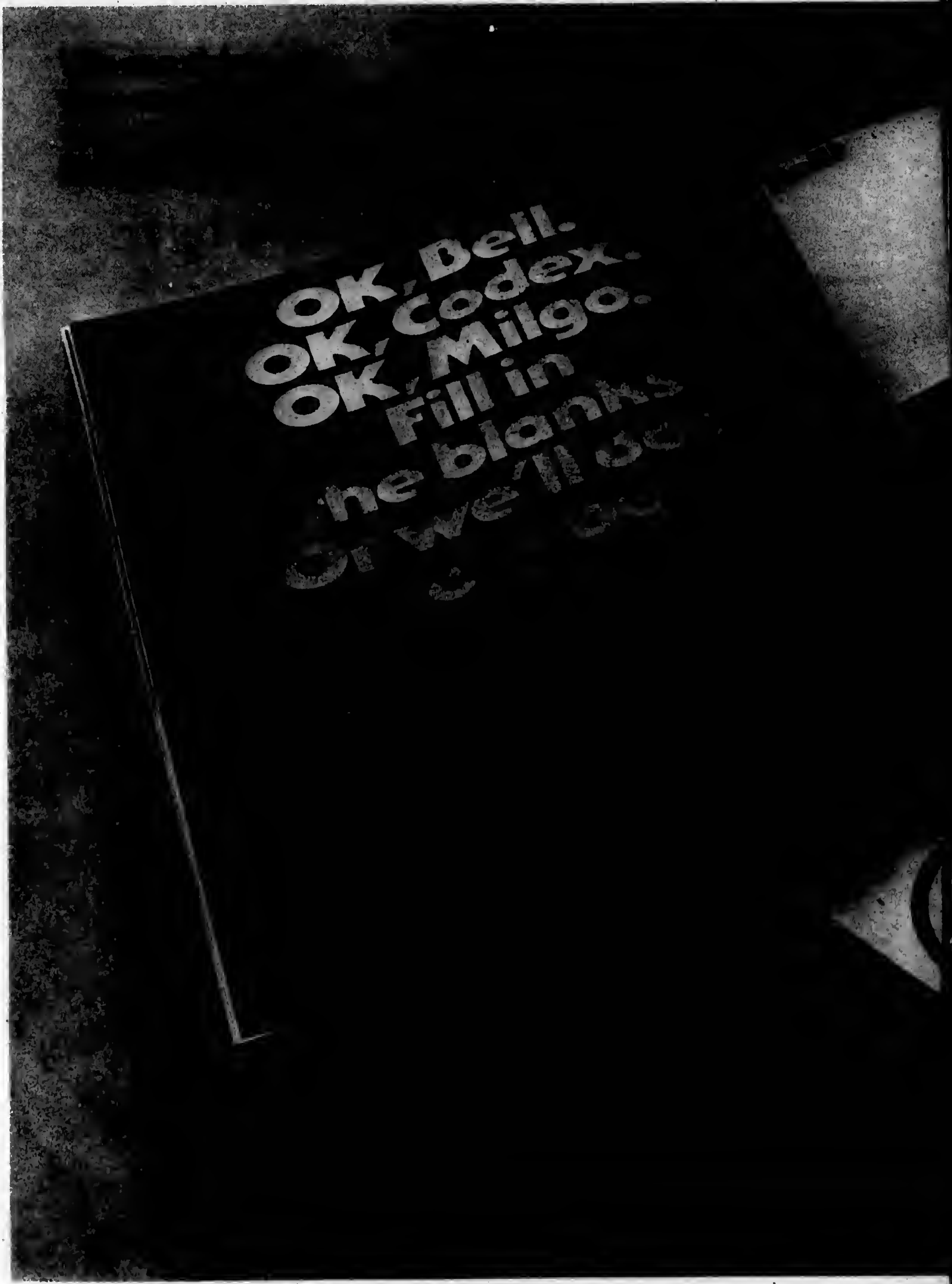
A smart modem then becomes the basis for automated management and restoration of multipoint networks. Conceptually, the find/decide/restore periods associated with the troubleshooting are drastically reduced when the information is retrieved and automatically analyzed against predefined boundaries of parameter status limits.

Fast Restoration

Restoration of an unavailable circuit was formerly measured in hours and days. It is now possible to restore an outage within seconds or minutes.

Controllers like Paradyne's Analysis I perform automated management and restoration of multipoint networks. The microprocessor-based modem is the prime source of diagnostic intelligence and the controller collects, analyzes and displays this data on a CRT screen.

Brauner is modem product manager at Paradyne Corp., Largo, Fla.



Operating in 35 States

Xerox Offering Management Services via T/S Net

By Bob Goodwin
Special to Computerworld

LOS ANGELES — For the last seven 'years, Xerox Computer Services has provided business management and financial information services to all sizes of businesses via a time-shared data communications network. All applications are integrated, and business data is always on-line and available for inquiry, update or reporting.

Today this network includes over 75,000 miles of communications lines nationwide with some 1,400 terminals operating in 87 cities in 35 states.

Serving the client base are 11 large-scale host computers at the national data center here. Thirteen satellite computers function as communications concentrators and/or high-speed printer drivers in various major cities.

The data base accessed by network users exceeds 10 billion characters and requires 350 disk drives. Over 100 million print lines are generated every month.

A central data base for a given customer can be accessed by that customer from any number of terminals throughout the U.S.A. A password system assures security of customer data. Terminal density varies from one per customer to over 100 for a large multistate user.

Network customers are primarily manufacturers and wholesale distributors with annual sales ranging from $1 million to $50 million. Local governments and utilities also subscribe to the service.

Typical Terminal

The typical customer terminal is a Xerox 1340 operating at 10-, 15- or 30 char./sec with the capability of automatic retransmission of parity or block errors and remote diagnostics, as well as forward/-backward printing capability.

The terminal operates in either the block error mode or as a standard Ascii terminal with character parity checking. In the retransmitting mode, keyboard entries are coded as Ascii bit patterns with parity bits.

The Ascii character string is then appended with an LRC character which is included in the transmitted message.

At the receiving point, the message is again subjected to the LRC generation and LRC comparisons are made. The automatic retransmission-on-error feature allows such crucial items as invoices and payroll checks to be prepared at the terminal with an assurance of accuracy.

FDMs and TDMs

A typical customer terminal ininterfaces to a frequency division multiplexer (FDM) subset operating at 110-, 150- or 300 bit/sec. About 75% of the client terminals are within 25 miles of the satellite computer concentration point where the client accesses the synchronous network, but some are as many as 7,800 miles apart.

Concentration points are in two forms: satellite computer or time division multiplexer (TDM). Computer concentrators provide the dedicated port at branch locations where individual terminal messages are formatted and placed in the synchronous data stream.

TDM concentrators extend the dedicated port from a remote computer location. Concentration points are interconnected through voice-grade private lines suitably conditioned for 9,600 bit/sec transmission; 9,600 bit/sec modems are utilized throughout the synchronous network.

Three Diagnostic Tests

The network's diagnostic feature provides for three basic tests:

- The basic terminal (keyboard output through the terminal electronics to the RS-232 interface and back through the input side to the terminal output at the printer).
- The FDM unit is "looped back" through the analog side of the unit (testing approximately 95% of the FDM unit electronics) to determine the capability of the terminal to transmit and receive through the FDM unit.
- Testing the error retransmission electronics in conjunction with the remainder of the terminal.

Proceeding through the test sequence allows a high degree of probability that the terminal operator can correctly diagnose a potential terminal problem.

Pass-Through Transmissions

Messages from remote computer locations may be routed through one or more other computers before that message arrives at its final destination. This is called "pass-through" communications.

Messages typically are routed directly to a host computer. When a primary communications link is out of service, however, pass-through communication permits messages to reach their destination through a more circuitous

(Continued on Page S/26)

Focusing on Reservations Centers

Airline Revamping Entire Data Net for More Efficiency

MIAMI — Most airlines have very comprehensive real-time, on-line interactive systems, complete with a vast array of transmission lines and communications equipment. But instead of adding new lines and terminals to handle the enormous communications workload brought about by increased air travel, data processing and data communications, people at the airlines are discovering new ways to make existing facilities do the job.

Eastern Airlines, based here, is one of the carriers at the forefront of this new networking idea. Under the direction of Robert DeLoach, director of communications, Eastern is currently in the process of revamping its entire data network. In accordance with the new game plan, Eastern officials are concentrating their efforts on putting more communications power in their nine reservations centers across the country and using these centers to feed their System One reservations computer here.

"We're making our system much more efficient," said Steve Barnes, Eastern's manager of data and radio communications. Instead of using several long-haul, low-speed links to our reservations centers, we're using 9,600 bit/sec multiplexed links to the centers and extension links at 2,400 bit/sec to our airport locations. In addition, we have extensive diagnostics and restoral capabilities to handle problems right at central sites rather than dealing with them on a local basis."

Passenger Processing

The Eastern system handles reservations and passenger processing tasks, such as ticket printing and reservations confirmation for cities served by Eastern in the U.S., Canada, Mexico and the Caribbean. There are 37 leased circuits covering nearly 28,000 miles and 3,500 terminals.

Mainframe equipment includes IBM 370/195s (one on-line and one standby) with an IBM 370/168 on order. For diagnostics and backup, Eastern will use an NCS4000 network control system from Intertel, Inc. of Burlington, Mass., with Intertel MCS1200, MCS2400, MCS4800 and MCS9600 modems, replacing Bell 201, 208 and 209 modems as well as similar Milgo modems.

With the addition of new equipment and the consolidation of existing facilities the new system will now do the same work with considerably fewer lines and at a great savings to the company, officials said.

"We're really consolidating our system in our reservations centers and saving quite a bit of money in the process," said John Steele, technical specialist on Eastern's System One. "Take our Atlanta office, for example. We now have four circuits between Atlanta and Miami and when the new network goes in we'll do the same job with two circuits. We should save thousands of dollars a month nationwide in circuit costs alone.

'Some Drawbacks'

"Consolidation does have some drawbacks, however," Steele noted. "Uptime and system availability become much more important, and certain communications links and sites are especially critical to the operation of the entire system. If those segments of the network go down, and Eastern people can't find the problem quickly enough, the entire network may be affected."

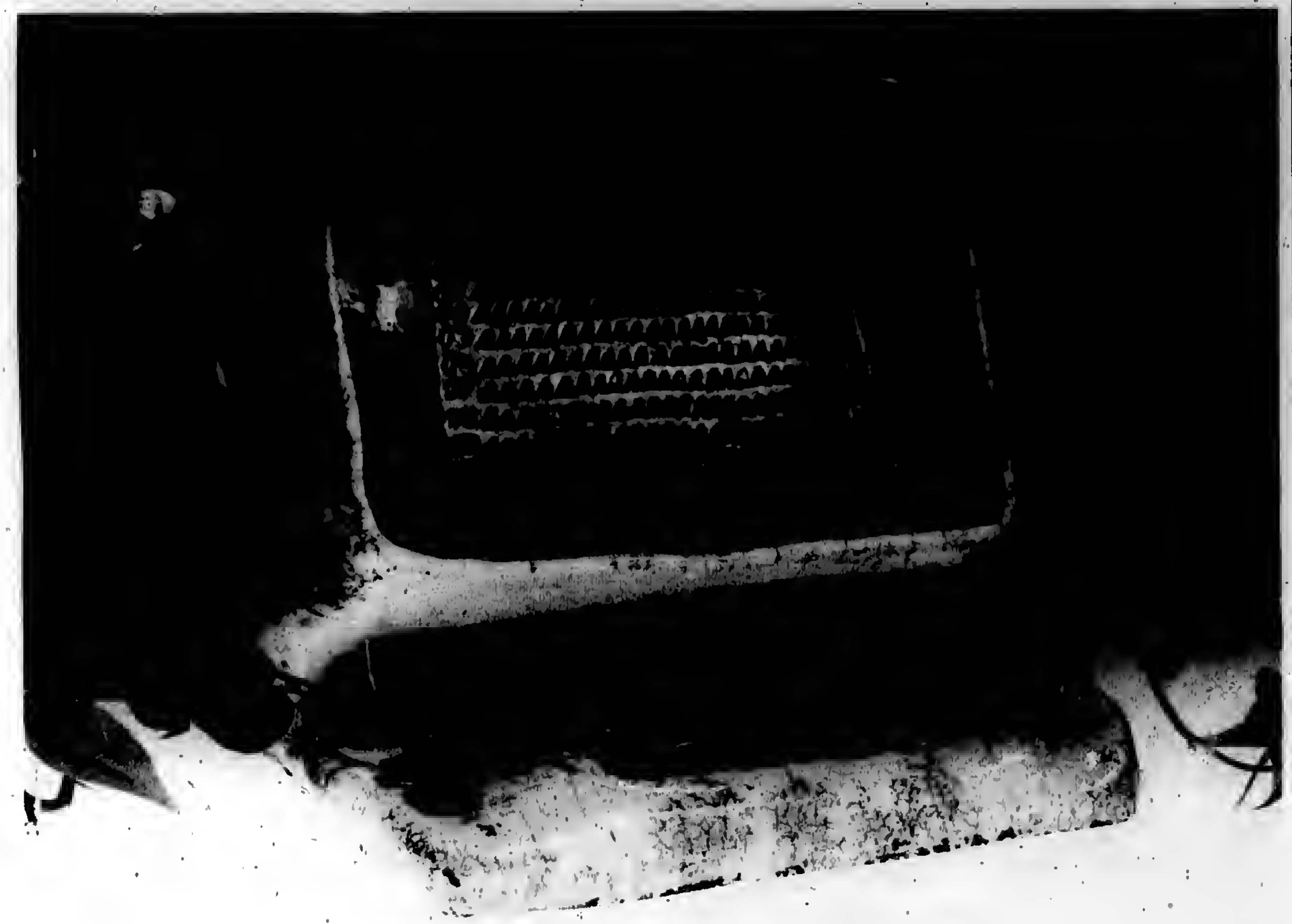
Because network integrity is so important, manager Barnes explained, Eastern chose Intertel's NCS4000 to help control the network from the central site at the Doral Computer Center here in Miami. The Intertel system has diagnostics that isolate problems to a specific line modem or data terminal and remote restoral commands that switch in dial backup lines to take care of data traffic while repairs are being made.

Intertel's experience with other airlines, such as Pan Am, American and El Al, and the ability of the Intertel equipment to check the integrity of a communications system as a whole, rather than in individual pieces, also figured heavily in the decision, Barnes said.

Eastern looked at several other vendors, but the company settled on Intertel because the Intertel system can run diagnostics and provide backup outbound from multiplexers and concentrator sites. If trouble develops on any link in the network, central site personnel can find the trouble and restore service with a dial network backup connection in minutes.

"Diagnostics are fine," said Barnes. "But they can't stop at a multiplexer or a remote processor; they've got to go out as far as the network goes."

The Eastern system now has 95% availability. When the new network goes into operation, airline officials expect even better results.



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Similar to Packet-Switched Net

CSC Infonet Has Virtual Line-Switched Architecture

By Phil Tenkhoff
And Jim Collard
Special to Computerworld

The Computer Sciences Corp. (CSC) Infonet remote computing network serves more than 100 cities in the U.S., Canada and Europe with approximately 150,000 channel-miles of dedicated circuits. The base for this totally integrated network, which provides toll-free access to any host computer from any point of the network, is a virtual line-switched architecture.

A virtual line-switched network is similar to a packet-switched network, except the path does not vary over the length of the call. In other words, the user establishes a single logical connection path between a network access point and a host computer. However, a "data link redundancy" feature serving a function similar to that of alternative routing is included in the design, whereby the loss of a single transmission link (modem or circuit) does not break the logical connection path.

Another similarity between Infonet's virtual line-switched network and a packet-switched network is the routing function performed by "switcher" remote communications concentrators (RCC). Incoming blocks will, in general, contain multiple message segments destined for different host computers. The communications software in the switcher RCC performs the appropriate switching for these message segments. It was the design and integration of these switchers which facilitated the total integrated network capability.

Separate Routes

To provide immunity to circuit and modem failures, connections between terminal RCCs and switcher RCCs are via two diversely routed dedicated circuits. In general, each of these circuits operates at 9.6 kbit/sec. A Codex hardware biplexer is used to derive a single, logical 19.2 kbit/sec trunk from the two physical 9.6 kbit/sec circuits.

This concept provides remote concentrator-to-computer center transmission at 19.2 kbit/sec while increasing overall communication network reliability. In the event of a failure of one of the links, all traffic is automatically diverted to the other link.

If network load is not excessive, such a failure would not be perceptible to the terminal users. Under high network load, the terminal RCC software will send delay messages to bulk terminals. This will have the effect of a slight slowing down on those terminals connected to the affected terminal RCC; conversational terminals are not affected. The remainder of the network is totally unaffected.

To further insure independence of the two links, Infonet uses one dedicated voice-grade circuit with 9.6 kbit/sec modems and one Dataphone Digital Service (DDS) circuit operating at 9.6 kbit/sec (in areas where DDS is available).

In addition to providing access to any host computer from any point on the network, the switchers made host computer addition a straightforward process. CSC currently operates 11 Univac 1108 computers under Infonet's proprietary operating system at two computer centers located in Los Angeles and Chicago.

New host computers located within these centers can be integrated into the network within a few hours since there is no dependence upon additional common carrier services. In addition, 1108 host computers located at customer sites can be integrated with the provision of dedicated circuits from the switcher RCCs to the host.

In addition to the increased reliability, the upgrade of trunks to 19.2 kbit/sec provides the network with capacity-related advantages. Using logical 19.2 kbit/sec trunks in lieu of 9.6 kbit/sec trunks reduces by a factor of two the number of trunks terminal RCCs and switcher RCCs must support.

This manifests itself in a savings in RCC core space; this saving permits additional input ports to be configured and allows the network to meet the growing customer demand for higher speed terminals. A typical terminal RCC supports 66 low-speed and 18 high-speed ports.

RCC throughput performance has also been increased with the upgrading to 19.2 kbit/sec trunks. Prior to this upgrade, two 9.6 kbit/sec trunks were used. Since each call was assigned to a specific circuit, lower circuit utilizations were realized in order to provide adequate margin for additional incoming bulk terminal calls.

Performance Monitoring

As an integral part of providing a highly reliable network, provision must be made for network performance monitoring and fault isolation. With the evolution to the more complex integrated

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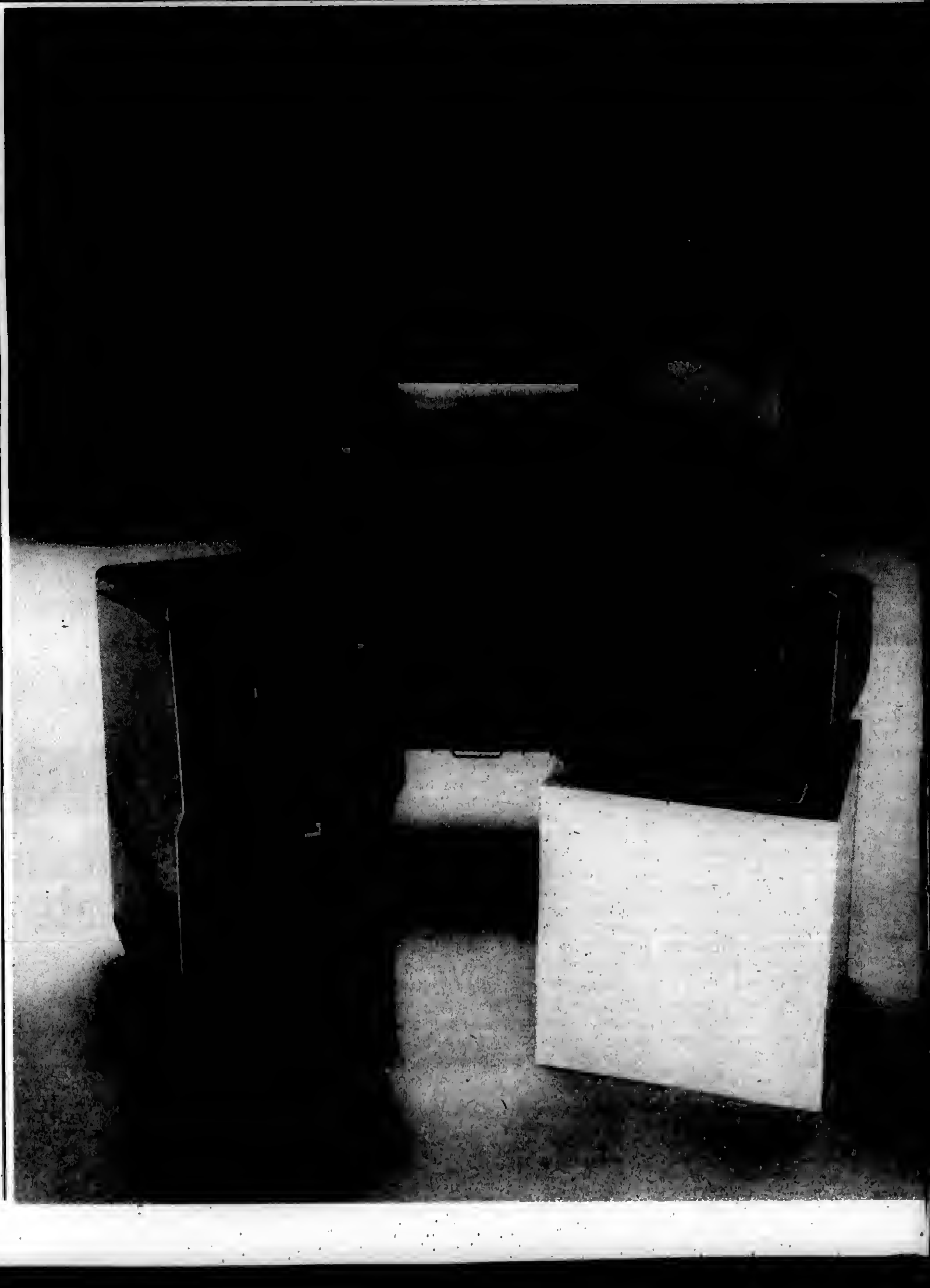

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Of Headquarters and Divisions

Nationwide Net Aids Major Mining Firm's DP Needs

NEW YORK — The Anaconda Co., with 23,000 employees in over 50 locations around the U.S. has data procesing requirements of major proportions. When each of seven major divisions has its information needs added to those of corporate headquarters, the problem is not only data processing but data communications as well.

Anaconda meets its corporate and divisional DP needs through nationwide communications facilities featuring four major in-house host computer sites; a large number of remote terminal systems, including key-to-disk and remote job entry terminals; computer-to-terminal and terminal-to-terminal communications, which allow an optimum mix of local processing and use of host facilities; and innovative use of software.

The current Anaconda communications networks are configured around the following host computers:

- IBM 370/135 in Chicago, handling the Wire and Cable Division and New York corporate headquarters.
- IBM 360/50 in Louisville, Ky., main office of the Aluminum Division.
- IBM 370/135 in Butte, Mont., divisional headquarters for the Montana Mining Division.
- RCA Spectra 70/45, Waterbury, Conn., headquarters of the Brass Division.
- In addition, the company uses outside time-sharing services for processing financial planning data and on-line computer-based message switching.

Connected to host computers by 4,800 bit/sec dial-up lines are a variety of terminal systems from Data 100 Corp. serving several divisions.The corporate headquarters has a Data 100 Keybatch and a Model 78 remote processing system. The Wire and Cable Division has the following Data 100 terminal systems:

- Batch terminal systems located in Greenwich, Conn.; LaGrange, Ky.; Tarboro, N.C.; Muskegon, Mich.; Marion, Ind.; Harrisonville, Mo.; Eden, N.C.; and Lexington, S.C.
- Keybatch systems located in Sycamore, Ill.;York, Penn.; and Overland Park, Kan.

The headquarters office of the Uranium Division in Denver, Colo., uses a Data 100 remote batch terminal system.

The addition of a remote terminal system has greatly extended the operation of Anaconda Co.'s New York headquarters.

The New York office developed the salaried payroll, savings plan and personnel applications for divisional use and also provides special jobs for individual divisions. Each division maintains the master files for its administrative and financial data at a host computer site, with the remote terminals used for input.

Some data is consolidated and forwarded to the New York site, which performs off-line and on-line editing through the terminal systems. The New York terminal system can query its host computer site to determine whether changes in data submitted are valid, compared against master files maintained at the host site.

For most major jobs, edits, updates and corrections are transmitted to the host computer site, where the master files are updated and the reports are generated.

Financial data is transmitted directly from the divisions and corporate headquarters to an outside time-sharing service. The data is then massaged from terminals in New York and the reports printed out there on terminals or a printer. From there, the reports are made available to management.

The New York site also does a number of large remote processing jobs for the corporation. Among these are pension mailings, which require printing 9,000 to 10,000 checks with envelopes and labels, and employee savings plan statements. Such jobs run under RPG and IBM 2780 emulation with master files sent to New York from the host locations.

The Anaconda system permits considerable communications flexibility, according to Joseph P. Ferrugio, manager, corporate systems and processing. For example, the New York remote processing system may communicate directly with other terminals of

(Continued on Page S/27)

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Sycor flexibility lets you tailor a Model 410 to meet your specific requirements. Choose from three additional speeds of printers (120, 180 cps and 300 lpm), up to 64k bytes of memory, 5 or 10 million characters of fixed-disk storage and cassette or flexible disk interchange.

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The Sycor 410 and the Sycor 440 (a clustered system with up to eight CRTs and 20 mb of storage) let you distribute processing power across your network without under- or overequipping a branch site. The result is cost-effective distributed data entry and processing. At all locations.

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To learn more about all the ways the Sycor Model 410 can stretch your data processing dollar and increase the processing power of your remote locations, send in the reply card today. Or call the Sycor office nearest you. You'll find it in the Yellow Pages under "Data Processing Systems."

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Net Relies on Information Transmission

Iowa Bank Chain Offering Paperless EFT to Customers

DES MOINES, Iowa — Paperless electronic funds transfer networks are more than just a concept with Brenton Banks, Inc. The bank chain has had an EFT network operating since February which relies almost totally on the transmission of information instead of paper records.

"All of the other approaches I know of retain paper somewhere in the process," according to James Fogt, Brenton's controller. "At the least, they require customers to sign withdrawal or deposit slips or both.

"I'm not speaking here of automated teller machines, which we also incorporate in the system, but of banking terminals in retail establishments. And I'm not talking about savings-and-loan applications that don't have to worry about checks, although even those revert back to paper when they get to the proofing stage," he noted.

"Our EFT is completely paperless, yet it has a built-in audit trail — and that does depend on paper — which our own auditors and those of others say is "excellent."

Known as "Iowa's First Family of Banks," Brenton Banks was organized in 1948 as the state's first resident, multibank holding company. Today its 17 affiliated banks have 42 locations in 27 cities and towns.

Although the Brenton EFT network is designed to run with a 64K NCR Century 101 computer, the holding company elected to install a 96K Model 151 with two tape drives and two disk drawers, the latter capable of storing 29M characters of information. NCR 279 terminals are linked to the CPU by private phone lines.

Fogt said 22 stores were ready for terminal installations, but 16 were selected to launch the network. They are located in Des Moines, Cedar Rapids, Marshalltown, Vinton, Perry, Jefferson, Indianola and Waukee.

In addition, teller terminals were installed in four banks: Fidelity Brenton Bank and Trust Company in Marshalltown, Jefferson State Bank, Warren County Bank and Trust Company in Indianola and Northwest Brenton National Bank. The banks' use of these terminals is largely experimental, Fogt said.

Transactions Climbing

The first issuance of personal identification numbers (PINs) and plastic cards covered 80% of the potential customers. Based on this number of cards, Fogt said, transactions have shown a steady climb of 20% each month since the beginning.

The customer enters his four-digit PIN at the supermarket courtesy counter.

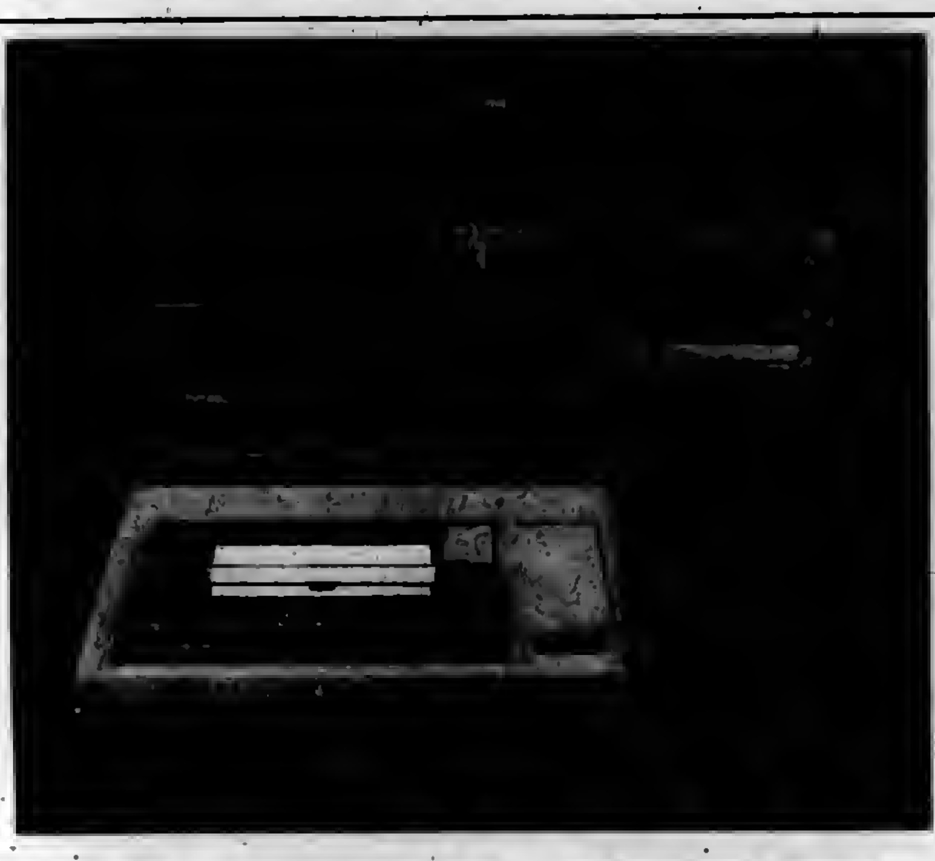
Advertised as "Shop 'n' Teller," the Brenton approach is simple and straightforward for customer and merchant alike, according to Gene Ketchmark, systems manager for the Brenco Automation Center, Inc., which maintains the bank's data base. Ketchmark explained how the system works:

Having given the store employee his card for entry into the terminal, the customer enters his four-digit PIN, using the 10-key pad of the terminal at the supermarket courtesy counter. He then tells the store employee the transaction he desires — withdrawal from or deposit to a checking or savings account. (The system can be adapted for charge cards, too, but this function is not presently being activated.)

The store employee then indexes his operator number, the code for the transaction and its amount. The computer verifies the PIN and account information and approves any transaction, Ketchmark said.

For cash withdrawals, each bank sets its own limitation, he noted, usually $100 in any 24-hour period, with automatic resets for weekends. The bank can vary the amount for individual accounts and can also determine for each account how much of a deposit may be credited for instant clearance. The merchants have discretion, too, for restricting cash disbursements to hold down the amount of cash they must keep on

(Continued on Page S/20)



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Which way is up?

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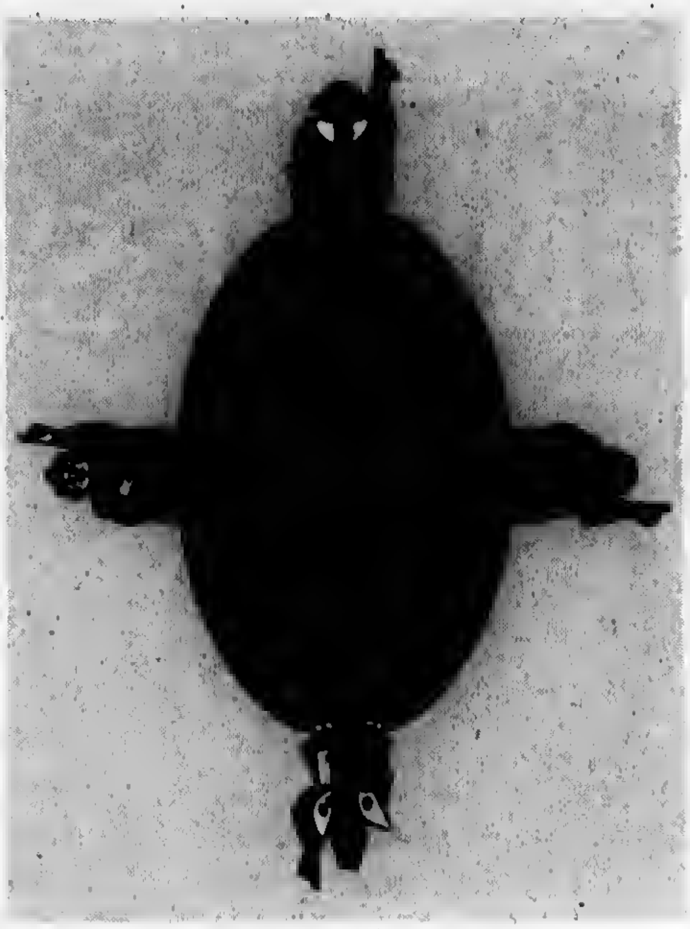

This sequence begins with the replacement of existing IBM 3270 displays, keypunches or remote batch terminals with compatible Four-Phase systems at a few key sites. On these pilot installations, field-proven software speeds the implementation of local transaction processing, local data base management, report generation and communication with the central computer.

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Iowa Banks' Paperless EFT Network Relies on Accurate Data Transmission

(Continued from Page S/18)

hand.

When the transaction is completed, the terminal imprints a customer receipt which records each step and includes an identifying terminal number. This is one portion of the paper audit trail. The other is the terminal's locked-in journal tape, which duplicates the information on the receipt, Ketchmark explained.

At the computer, however, the transaction is recorded on both a magnetic disk pack and magnetic tape. At 6 p.m. each working day, the data on tape is transferred for input to the Brenco Automation Center's main computer where the master records are maintained.

EFT activity is posted first, followed by conventional paperwork. This way, the validity of an EFT withdrawal is ensured, he said. The only item that can be returned is one written on paper. And bank officers have the option of reversing such an item when the scan the computer's exception report the next morning.

"Unlike the situation with conventional paper checks, the merchant can't lose," Ketchmark emphasized. "The bank, via the computer through the terminal, has told him the withdrawal is good and he receives immediate credit in his account."

Catching Errors

What if there's a malfunction due to either hardware or software failure? Ketchmark readily acknowledged this is possible. He pointed out, in fact, that the debugging of computer programs doesn't prove they're error-free; it merely shows they work. The chance for error still exists.

But the Brenton system guards against such a possibility, however slim, going without detection and correction, he added. The customer has his receipts which he can compare with the entries on his monthly statement. And the merchant has his journal tape for comparison against the computer's daily computation of his debits and credits.

In a similar fashion, electronic notations of transfer for interbank settlements are also protected. If there is a discrepancy, it can be traced back to a specific terminal and a single transaction.

"Nor can a customer sit at home and manufacture bogus receipts," the systems manager continued. "Before any 'correcting' transfers would be authorized, the notation of data, transaction number and time on the receipt would have to agree with those on the terminal tape."

Today, the customers of any participating Brenton Banks' affiliate may use the EFT system because the common data base is maintained by Brenco Automation Center. By March 1, under provisions of a law passed by the Iowa legislature, any customer of any of the state's 660 banks must be able to use any retail terminal, regardless of which bank installed it.

The new law will be put into effect by Iowa Transfer System, Inc., a corporation formed by the state's banks. Dial Financial Corp. of Des Moines was hired to develop the interconnection for the different data bases.

While the use of Brenton's "fingertip banking," may be more convenient than writing and cashing a paper check, development of the system was quite another story. To begin with, Fogt related, the organization went through months of frustration with vendor selection.

"We did not consider it feasible to do the job ourselves. That would have taken two or three years and we wanted to get moving immediately."

Finally Brenton contacted NCR, Fogt said. The company sent a team of systems experts to Des Moines. After determining that NCR's existing packages couldn't be successfully modified because they used paper in the processing, work was begun on writing new programs.

This occurred in May 1975. By July, Brenton executives were

(Continued on Page S/26)

The store employee indexes her operator number, the code for the transaction and its amount.

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A NEW Remote

After Its Acceptance

Where Can Retailers Take POS for Guaranteed Rewards?

By Dan A. Barnes
Special to Computerworld

Now that the initial benefits of point-of-sale (POS) terminals and networks are accepted by a majority of the retail community, where does the retailer go from here?

There is one certainty — he won't go anywhere until assured of a good return on any further investment.

For example, when a retailer who's been capturing data on punched paper tape and using an on-line credit authorization system replaces this system with an electronic POS system, he is actually duplicating some of the capability and benefits he already enjoys.

Additional Payoff

Investment in any new system must offer an additional payoff. This could be better customer service, faster and more accurate data capture and processing or reduction in operating expenses. Or it could be regarded as increased flexibility to automate and integrate other areas of retail operations and applications made possible by POS.

The anticipated length of life of any new system is particularly important in today's uncertain, yet rapidly evolving technological, economic and regulatory environment. Generally, a retailer expects a two- to five-year tangible return on investment, in combination with an eight- to 12-year useful systems life. Thus, the trade-offs between prior system investment versus new are very important.

Retailers who have installed POS systems in the past five years are likely to keep their initial equipment in place for another three years. Any investment in new systems will probably happen one step at a time, on an application basis, as well as by store location. So operating and communications compatibility with existing systems, plus flexibility to continue working and be updated for the next eight to 12 years are key considerations.

The retailer's biggest consideration for future POS systems will be in making information more useful to everyone in the organization.

More useful information is information that helps improve profits. An historical example is a fashion-oriented women's ready-to-wear chain with stores in over 70 cities. Its central office exercised control over buying and inventory. Sales reports by SKU members were assmbled by recapping written sales slips at each store and then sent by mail to the central office every Saturday night.

> *'The POS system and equipment users are looking to today must be very adaptable to meet growing and changing requirements.'*

Three experienced buyers placed all merchandise orders. Over the years, they became experts at extrapolating sales information from particular stores. They knew if a specific new item was selling fast in a certain store in one city, chances were it would also sell at similar stores in other cities. Orders were placed immediately for these other stores while manufacturers might still have available stocks.

That use of information was the key to profits for this retailer. But retirement of one buyer, escalating labor costs of the system and slower mail service eventually forced him to use electronic data collection at each store, plus data communications and home office computers to maintain his "competitive edge."

This example shows how we should strive to extend the usefulness of electronically generated information today. How far have we come?

How Far Have We Come?

Early computer technology allowed the retailer to automate his general accounting applications, enabling him to receive the reports he needed for improved financial control.

Batch-oriented computer processing was then applied to the control of inventory. The addition of punched paper tape to cash registers in 1957 helped the retailer improve his merchandising mix — particularly in expanding department/class sales information and staple stock replenishment applications.

Then, data communications of the late 1960s greatly accelerated transmission of information to the central computer. It also reduced paper flow and labor content generated by transactions and provided more timely operating information.

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(Continued on Page S/29)

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New Communications Standards Being Developed

(Cantinued from Page S/2)

regarding the way in which these commands and responses are to be used for various applications involving different terminal and link configurations. Consensus is slow to achieve because of the many members who must all be satisfied with the proposed standard.

IBM, because of its ability to act unilaterally in product announcements, has announced its own Synchronous Data Link Control (SDLC) procedure, which is quite similar to HDLC, but not fully compatible at present. Some other vendors such as Burroughs have announced they will be compatible with SDLC, ADCCP and HDLC. Digital Equipment Corp., on the other hand, has continued to pursue its own link control procedure (DDCMP) which is quite different from any of the proposed standards.

As strong vendor participation continues in the final development of HDLC, it seems likely that a standard will eventually emerge that will be implemented by most of the major vendors.

Packet Switching

One of the most dramatic standards developments in the last few years was the adoption of Recommendation X.25 by the CCITT at its quadrennial plenary assembly this past September. Recommendation X.25 is a standard for interfacing host computers to public packet-switching networks. It includes both X.21 and HDLC in the appropriate portion of the standard and adds a set of packet formats and commands and responses for setting up "virtual calls" and transferring data through the network.

Agreement on such a worldwide standard seemed quite remote only a few years ago, and it was not until the major packet-switching carriers around the world got together privately that a consensus emerged. The standard has been criticized by some as lacking in certain features — notably the standard does not cater to the "datagram" service — but these deficiencies are already being addressed by proposals to add to the standard.

The key point to note about X.25 is that a workable solution has been adopted which averts the situation of multiple incompatible interfaces being implemented by carriers in each country. Thus, it will be possible for computer manufacturers and software houses to build and support only one interface for packet switching.

The data communications area is a very dynamic one at present and standards will continue to evolve to keep pace with the state of the art. Significant developments to look for over the next few years are the completion and large-scale implementation of work already begun, such as HDLC; additions and modifications to recently adopted standards, such as X.25; and the initiation of new work in areas not currently addressed, such as end-to-end protocols between host computers.

The lack of widespread user participation in the development of data communications standards (with the major exception of the Federal government) is unlikely to change, although some users may finally begin to recognize their interest in these issues. User participation is certainly welcome on all standards committees.

Cotton is a camputer speciolist with the Institute for Computer Science and Technolagy at the Nationol Bureou of Standards.

Value-Added Net Serves Many CPUs

(Cantinued fram Page S/3)

host on any schedule. For instance, if a customer normally runs accounting from a terminal at three o'clock in the morning, this can be automated.

In 1977, we will be deploying Tymnet II. In the current network, if a line or node goes out, the circuits over that line are broken and the user has to log in again. In the new network, the circuits will be rebuilt with no loss of data or inconvenience to the user.

Circuit routing will be more sophisticated. For instance, given a choice between a 50 kbit/sec satellite line and a 4,800 bit/sec land line, the supervisor will route a remote job entry user over the satellite to get the bandwidth. A low-speed interactive user will get the land line to avoid the satellite delay.

A message-switching service of very high quality and reliability will be provided. In addition to the features provided by conventional message-switch services, this will provide low-cost on-line editing, message transfer to host computers and interface to all terminal types supported by Tymnet.

Touch Tone input with voice answer-back will appear sometime during 1977. We will be compatible with the Transaction series of telephones except for the referral mechanism.

In Tymnet I, the software for a node has to be loaded by someone on site, typically from a magnetic tape cassette. A bug in this software can bring the node down. In Tymnet II, software is loaded remotely. Undebugged software can run in partitions without endangering the node. Debugging can be done remotely. This is important for providing quick response to customer interfaces.

Finally, the variety of terminals and line disciplines will continue to expand. We intend to continue our philosophy of supporting these things in the network and shield the host computer from their incompatabilities as much as possible.

Tymes is general group manager, netwark services and praducts at Tymshare, Cupertina, Calif.

Phone Net Mainstay Of Communications

(Continued from Page S/8)

vided three common types of conditioning (types C1, C2 and C4) giving successively higher quality circuits at increasing monthly costs. There are other C grades of conditioning for specialized or military applications.

Bell recently introduced a type D1 conditioning for two-point, 9,600 bit/sec service. It should not be thought of as being better than C4. Type D1 conditioning is accomplished primarily by facility selection rather than adding equalizers, and it also concentrates on other parameters more pertinent to 9,600 bit/sec transmission than attenuation and delay.

Reagan is managing editar af Datapra Communications Group. This article was taken from reparts published by Datapra Research Corp., Delran, N.J.

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Configuring Terminal Networks Requires Maximum Planning

(Continued from Page S/4)

should be placed.

- Two-wire or four-wire facility.

Although the service offerings and charges vary widely, the technical considerations are generally similar. The AT&T Tariff 260 covers multidrop, leased, interstate networks. Although intended to define the characteristics of interstate services, 260 is generally adhered to by local telephone operating companies. The tariff defines the characteristics of point-to-point and multidrop two-wire and four-wire leased-line facilities.

Although Tariff 260 is of some assistance in defining a standard that is used from state to state, most multidrop leased facilities have evolved over the years in their technical characteristics. As an example, it is customary in four-wire facilities to dedicate one pair to transmit and one pair to receive. There is no standard as it relates to which pair is which when the drop is installed.

It is a general consideration in all states that non-telephone company terminal equipment must have certain characteristics in order to function with the rest of the telephone machinery.

The availability of multidrop service in a particular locale is generally a function of the bridging equipment available in the telephone central office. Although to a computer or concentrator it may really appear that a circuit has 20 or 30 terminals dropped off along the way, electrically each terminal is connected point to point to a bridge in a particular central office. From that bridge all the signals are combined into one circuit that is terminated again in a point-to-point fashion at the user's computer location.

The actual copper wire is generally not a factor since most phone companies as they install new cables and new underground facilities have extra cable pairs in anticipation of expansion. If the telephone company does not have bridging equipment in the central office, off-premises bridges may be used that are either purchased outright or rented from the telephone company.

These bridges may be used to extend the capabilities of the local central office or in lieu of multiple drops such as in a large discount store. With these bridges the user may request the telephone company to install one drop and then connect a terminal at each checkout lane to that drop via the bridge.

In addition to bridges, concentrators and controllers can be employed to reduce communications costs and provide efficient terminal control. Concentrators may be of the hard-wired variety and do nothing more than concentrate several low-speed lines into one higher speed line.

Another type of concentrator provides intelligence in the form of polling, message formatting and network control. The proper choice of function and geographic placement of concentrators can produce enhanced performance and lower network operating costs.

Mixed Modems

Until very recently, most telephone operating companies would not allow the intermixture of Bell and non-Bell modems on a leased telephone circuit. However, new tariffs are being considered which allow intermixture of Bell and non-Bell modems.

Although the telephone companies offer modems for most traffic and signaling rates, for a large network the user should certainly investigate capabilities available in non-Bell equipment. A number of terminal devices, especially those intended for location at the point of sale, have modems integrated into the terminal.

In choosing modems there are several characteristics which tend to vary from modem type to modem type and manufacturer to manufacturer. Some of these characteristics are receiver sensitivity, clear to send time and carrier detect time.

Modems may be connected to terminals or computers via an industry standard EIA RS-232 plug. Within the EIA standard, the definition of the signals at each of the 25 pins in that plug is recorded. As with any standard, these are "almost universally" accepted uses for the 25 pins in the connector.

The local loop portion of the network is sometimes given through only at the later stages of system development. There are several considerations that must be made in defining multidrop configurations, especially for networks of any size.

Although the mileage charge and the drop charge for a given state may not be a factor which can be varied, there are a number of alternatives as to how users purchase those

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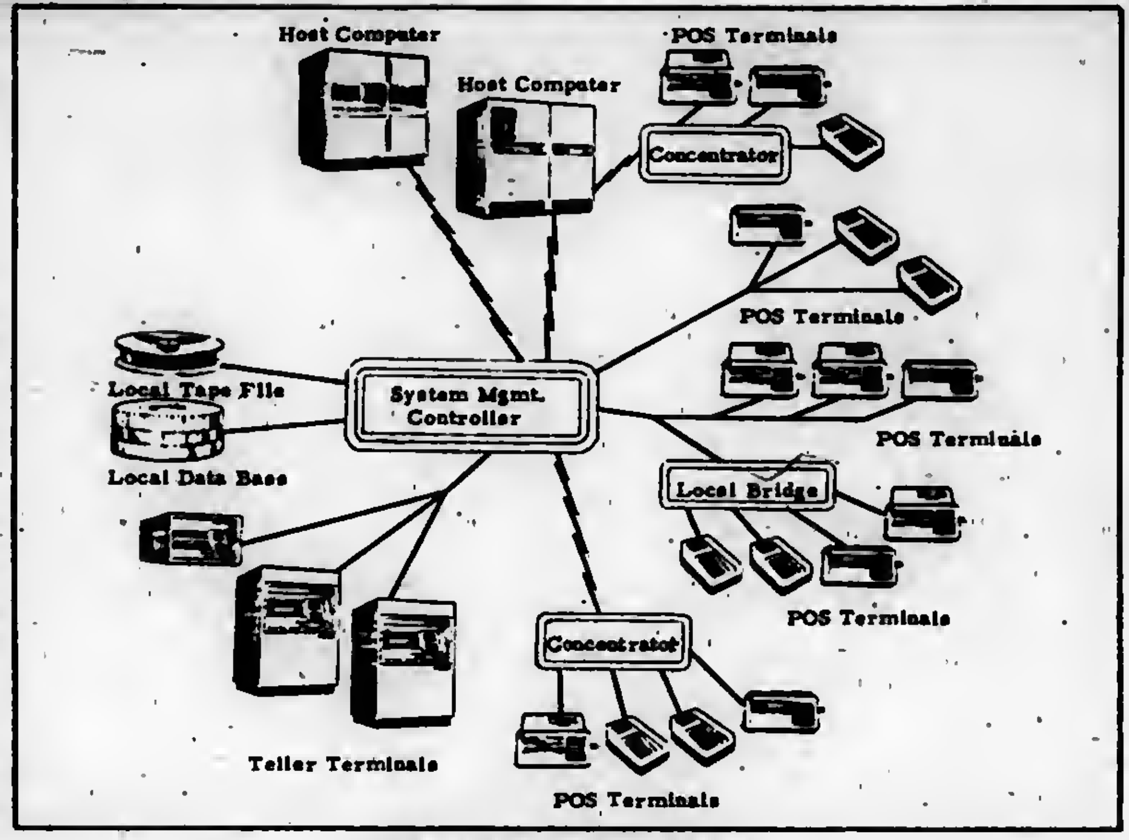

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Planning Needed Now

Users, Not Vendors, Must Shoulder Reliability Burden

By M.W. Green
Special to Computerworld

Data transmission capability is still largely dependent on the basic facility linking the originating data point to the terminating data point. In the pioneer days, these were telegraph lines and human relay stations. Now they are high-grade telephone circuits and even satellite links with enough electronic gear in between to scare Jules Verne.

The point is that the actual data link is and will be the critical portion of a data communications network. Its presence or absence is the difference between being operational and not being operational.

As more and more vendors steadily develop data transmission equipment and integrate their equipment with other manufacturers' equipment, diagnostics of network failures become less and less promising. Clearly, fault isolation in a multivendor data communications environment is an industrywide problem. It is this area of concern to which we must address ourselves.

It is evident that we can no longer place the responsibility of network diagnostics in the hands of multiple vendors. If we are to continue expanding our networks at the current pace, a large portion of the design must be emphasized in central site network diagnostics and control.

The ability to rapidly pinpoint inoperative equipment in the network, so corrective action can be initiated or backup procedures executed, will mark the difference between a fully operational network and one that is only partially available. Highly specialized devices such as network diagnostic centers and intelligent modems must be integrated into the network to provide the required capability.

> *'It is evident that we can no longer place the responsibility of network diagnostics in the hands of multiple vendors.'*

Early planning is the key. Not all data communications networks require the same degree of reliability. The first step in planning a network is determining the amount of reliability required.

If it is absolutely necessary that a line or group of lines be 100% operational, then obviously some form of backup is required. This can be accomplished by building in network redundancy through the use of backup lines, modems, multiplexers, terminals, etc. Needless to say, this can be a very expensive proposition.

An alternative approach is the use of limited redundancy in conjunction with central site diagnostics and remote intelligent modems. These systems can actually reduce network downtime by reducing the amount of time consumed in diagnosing problems. In many cases, it is possible to detect a potential problem and effect repairs or execute backup procedures before a downtime occurs.

These systems accomplish this feat by allowing a single individual at the central computer site to perform a multitude of network level diagnostic tests without remote site operator intervention. These tests include level measurement, analog and digital loop-back tests, bit error tests and protocol monitoring.

Problem Isolated

A problem can be isolated to a malfunctional unit virtually in seconds and accurate information can then be passed to the vendor responsible for repairs. This approach eliminates the "finger pointing" generally associated with multivendor installations.

Obviously one cannot simply add this capability to an already existing network. The compatibility requirements of the network diagnostics center and remote equipment dictate that the capability be designed into the network at the beginning. Generally it is not necessary to install the central site diagnostic equipment in the initial installation phase; however, remote site equipment must be selected to allow operational compatibility with central site diagnostic equipment in the future.

Equipment Expensive

While most of the equipment required to perform network level diagnostics is expensive, planned integration in an on-line network can prove to be one of the most cost-effective measures available in ensuring the reliability of the data communications network.

We are currently facing the onset of a new data communications era. With the advent of electronic funds transfer, more people will be affected by computer-based on-line data communications netwoks than ever before. All indications clearly point out that with the massive volumes of data and distribution of I/O equipment, network downtime will rank high as one of the most critical factors in the success or failure of this new industry. Now is the time for planning.

Green is director of communications with Financial Data Systems, Inc., St. Louis, Mo.

Configurations Need Maximum Planning

(Continued from Page S/23)

facilities from the telephone company. A clarification of Tariff 260 indicates, for example, that if any portion of a network is interstate, the entire network must be considered interstate. This interpretation not only may result in lower overall network costs because of the FCC control of interstate tariffs, but may also provide better service since that allows the user access to AT&T communications experts and engineers.

Most vendors of terminal and computer equipment have a great deal of expertise in the area of equipment as well as dealing with the local telephone company. They generally can provide the user the best immediate information on how to begin network planning.

Looney is manager of systems and software development for terminal systems with Addressograph-Multigraph Corp.

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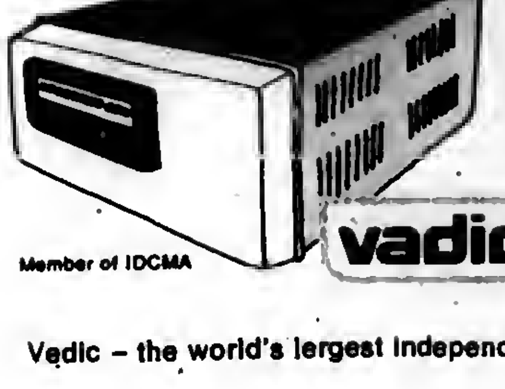

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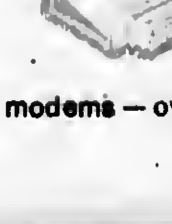

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Shipper Planning Data Links From Europe to New York

NEW YORK — A distributed data base system utilizing small business computers will use leased lines to link operations centers in four European port cities with the home office of U.S. Lines here early next year.

Two Wang 2200 computers with 16K words of memory each, a 10M-byte disk drive and a 165 char./sec printer have been installed at U.S. Lines' offices in Hamburg, Germany; Rotterdam, The Netherlands; Liverpool, England; and Le Havre, France.

In each location, the two computers have been multiplexed to the disk and are currently being used in a stand-alone mode. The systems, including CRT displays and keyboards, capture and edit data and provide a variety of reports for local managers relating to vessel manifests, customer invoices and accounts receivable.

By February, the Wang systems in Hamburg, Liverpool and Le Havre will begin transmitting data on both invoices and vessel manifests to the system in Rotterdam, according to Frank Keahon, manager of systems development for the shipping concern.

U.S. Lines has ordered microprocessor-based communications controllers from Wang for those transmissions, which will be made over dial-up lines approximately twice each week, Keahon said.

Data will be stored on disk in Rotterdam and forwarded via leased line to U.S. Lines' IBM 370/135 here two or three times each week, Keahon explained.

The link between the Wang and the IBM computers will utilize 2,400 bit/sec LSI-24 modems from ICC/Milgo and will employ standard IBM 2780 bisynchronous protocol running under Power/VS communications software.

No Keypunched Mail

Thousands of documents which are currently mailed from Europe to New York will be edited on site and transmitted directly to the home office mainframe through the 2200 system, according to Keahon. At present, the data received by mail must be keypunched in New York, but full implementation of the Wang system will eliminate that requirement, Keahon said.

"Besides eliminating redundant keyboarding, implementation of the Wang system will enable our 370 to generate outbound reports that will be useful to our managers in Europe — container lists, for example," he added.

"It will also enable us to automate preparation of our European manifests, which run as long as 400 pages and involve as many as half a million characters of data. Manifests and invoices are the two most important documents in the shipping industry," he said.

Howard Mah, project leader for the distributed data base system in Europe, explained "it takes a lot of data to prepare invoices and manifests, but once that information is captured we can make a lot of use of it.

"Right now, we are capturing and editing on the Wang computers about 60% of that data. By the time the data link between Rotterdam and New York is in operation, we will be capturing all of it," Mah predicted.

Some Lessons Learned

Keahon noted some of the lessons learned in developing U.S. Lines' distributed system in the U.S. — IBM 3270 terminals installed in 10 locations and running under IBM's Customer Information Control System (CICS) — were applied to the system in Europe.

"The costs of installing a similar system in Europe were prohibitive since dedicated lines to each operating center would have been required," he said.

"What we wanted was enough intelligence to provide a usable data base at each location in Europe. To provide that data base capability, we applied some large systems concepts to small computers," Mah added.

Such editing features as check digits, table lookups with insertion and universal update have been built into the system to enhance both speed and accuracy.

In preparation of a customer invoice, for example, an operator can key in a customer number. The system will automatically validate that number by checking it against a stored table and respond by displaying or printing the customer's name and address.

The customer master file stored at each location in Europe contains complete information on customers using that port or any port served by that center.

In addition, a vessel voyage master file stored on disk at each location contains vessel and voyage numbers, rates of exchange and sail dates and arrival dates.

"From the information stored in those local data bases, each of our operating centers can produce a variety of reports," Mah explained, "such as customer statements, dunning notices and the statements needed to pay our agents' commissions.

"The system also produces reports for local managers on accounts receivable or aging listings in sequence by customer number, vessel voyage number and invoice number.

"Some of those reports weren't prepared at all before we installed the computers and others which were prepared can be prepared in much less time now. Aging, for example, took approximately 20 man-days in one port before the computers were installed," he said.

> *'We wanted enough intelligence to provide a usable data base at each location in Europe . . . We applied some large systems concepts to small computers.'*

And while the volume of receivables at each port has increased by about 50%, those receivables have not stretched out. "That is true, in part, because of improved response from our customers," Mah said.

"When we send out an invoice now, our customers know and we know the invoice is correct. Invoices are also going out more promptly.

"The system provides each of our centers with vessel voyage checklists which reconcile what is invoiced against what is manifested. These checklists are now completed before the ship leaves port."

Selection Reasons

Keahon said U.S. Lines selected Wang over other small computer and small business computer systems suppliers because of cost and because Wang could provide the worldwide service required.

He estimated the value of Wang equipment currently installed in the four operat-

(Continued on Page S/29)

CLIP AND RETURN FOR FAST RESPONSE

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Data rates: Mixture of asynchronous channels up to 300 baud
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CSC Infonet Has Virtual Line-Switched Architecture

(Continued fram Page S/14)

network, additional hardware and software performance, and fault isolation features were required.

Hardware devices were designed and implemented to monitor high-speed trunk (terminal RCC to switcher RCC) performance. These devices provide the communication technical support engineer with an immediate assessment of any line, modem or RCC that is inoperative. In addition, the status of all host computers in all centers is constantly displayed.

All of this has been incorporated into the existing communication network without increased common carrier facilities. A small part of the available dedicated line transmission bandwidth is used to transmit operational status information.

An RCC power detection and controller provides a special indication if the remote terminal RCC has lost power. A recent engineering change has provided the technical support engineer in a computer center with the ability to power up a remotely located terminal RCC after a power failure.

Previously, a manual power-up at the terminal RCC was required. Since momentary power losses account for about one-half of all RCC hardware-related outages, this change has further enhanced network reliability.

A major software-driven isolation and performance monitoring tool was developed and is known as the Engineering Logger. This logger consists of software controlled by Infonet's proprietary operating system. It permits the technical support engineers to monitor principal parameters of network activity such as:

- High-speed trunk loading.
- Error retransmission frequency between RCCs and between RCCs and hosts.
- RCC utilization (processor and memory buffers).
- Host computer load status.
- Status of all terminal-to-switcher trunks.
- Host and RCC recoveries.
- High-speed trunk events (standbys, recoveries, etc.)

The integrated network, with the combination of the improvements discussed previously, has resulted in a network reliability of 99.8%, as measured from terminal RCC to host computer.

Tenkhoff is directar of system development ond Collord is manager of network engineering with CSC, El Segundo, Calif.

Banks Offer Paperless EFT

(Continued from Page S/20)

talking to supermarkets, asking them for guidance and seeking to sell them on a system that didn't yet exist. Then over the next three months, an NCR van was used to show affiliate banks the hardware that would be used.

"When we approached the supermarkets," Fogt recalled, "our thinking was that we know banking and that they would help us with understanding the needs of retailers. Very quickly we learned that grocery stores cash more checks than banks do and that a returned check costs them $1 to $2 in paperwork.

"This meant they were very receptive to something that would take the risk out of check cashing. We pushed two other major benefits: the customer convenience helps boost store traffic and the transactions are handled much faster.

"For the banks, of course, a new service such as EFT is always a competitive edge, at least for a while. But the biggest plus is the elimination of paperwork.. Conventional checks alone cost 15 cents to 22 cents each to process."

As a part of its EFT network, Brenton affiliate banks have installed six on-line NCR 770 automatic teller machines in Adel, Grinnell, Davenport and Des Moines, including one at the capital city's municipal airport. While he thinks both the "anytime teller" machines and the retail point-of-sale terminals are needed, Fogt pointed out "the two really serve different needs and neither is as expensive as the quarter to half million dollars it costs to put up a new office. Nor are they as permanent as bricks and mortar. If a location doesn't work out, we can move the machine to another site."

Other organizations have shown an interest in Brenton Banks' package. The software includes a range of capabilities from customer files through operating manuals and is being sold to other banks.

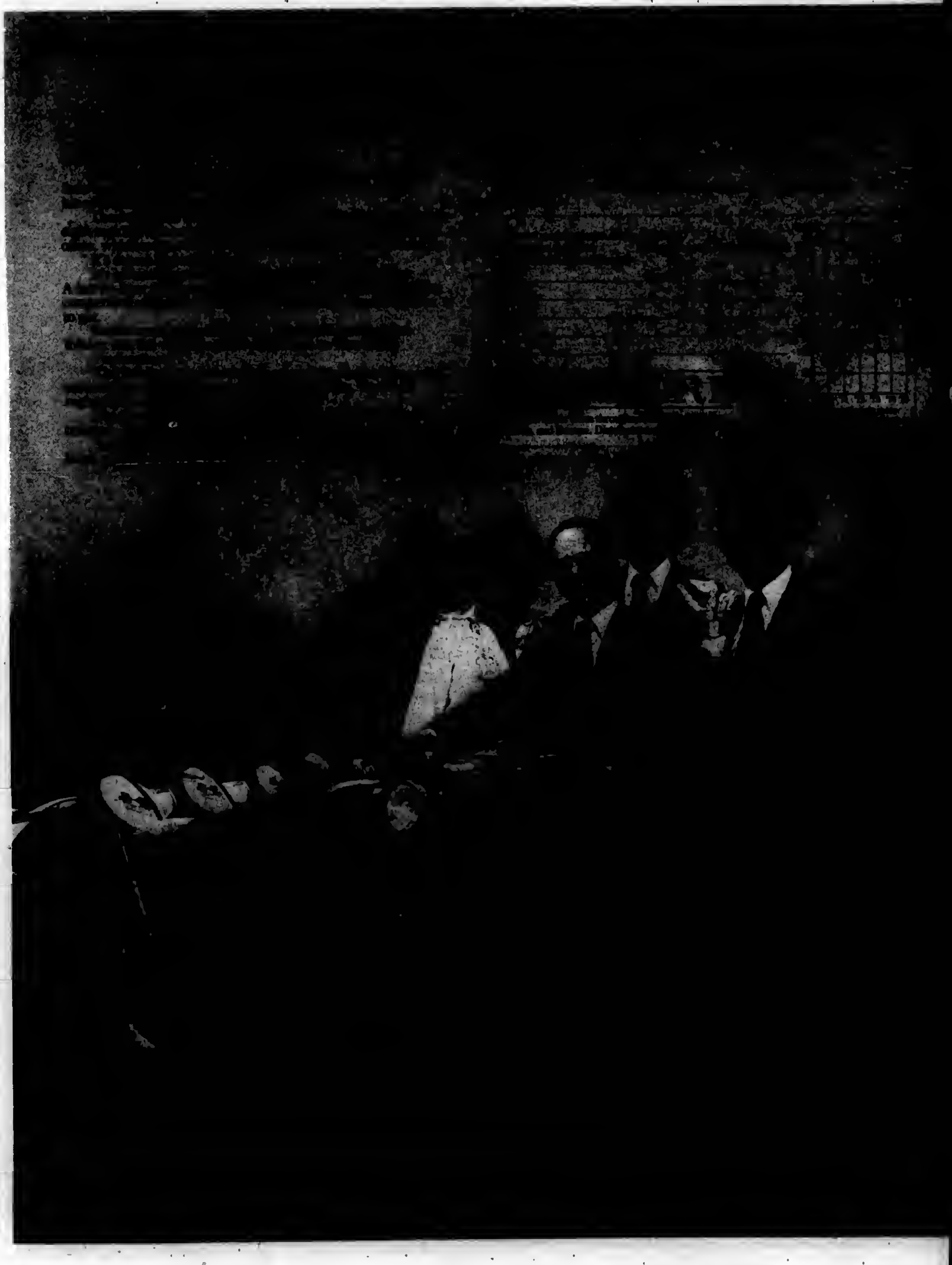
Xerox Offers Services Via Time-Shared Net

(Continued from Poge S/11)

path. The host processors themselves are also able to pass messages to each other in those circumstances where direct communications is not possible from the remote computer location.

The entire design of the terminal, communication network support and operating system software has been with the objective of trouble-free operation of the time-sharing service regardless of the performance of the communication lines.

Goodwin is monager of morketing administrotion at Xerox Camputer Services.



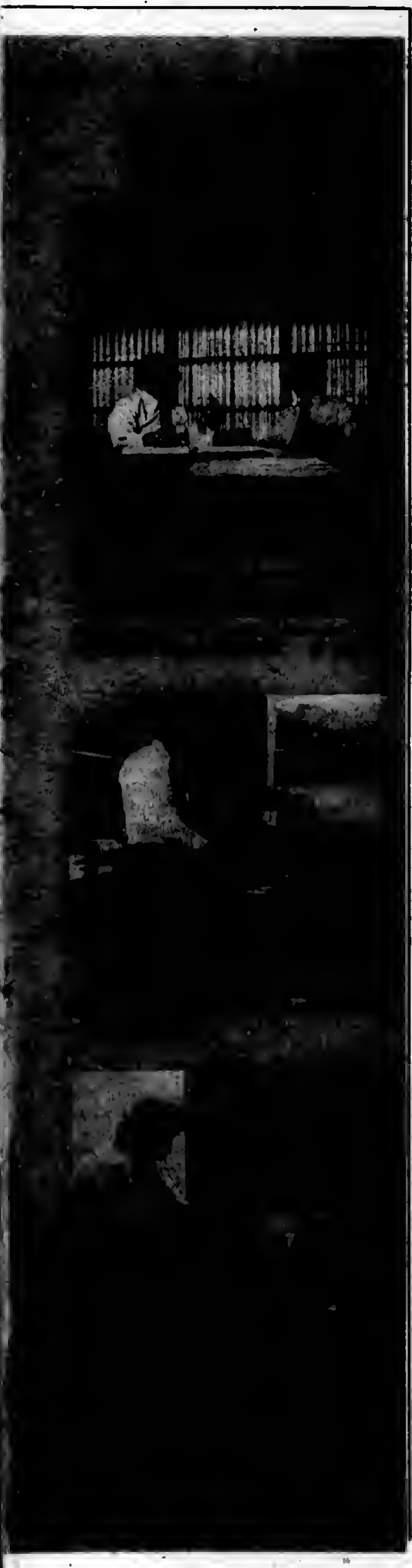
For Headquarters and Divisions

Nationwide Network Aids DP Needs of Mining Firm

(Continued from Page S/17)

various vendors around the country, without going through any host computer. Because the New York site must communicate with a variety of devices, the system there must emulate several different types of remote terminals, including the CDC 200 User terminal and the IBM 2780.

This capability is a major reason why Anaconda chose the Data 100 Model 78 remote processing system for its New York office, according to Ferrugio. "We visited a Data 100 customer with similar interface requirements and they were extremely happy with the performance of the vendor and the equipment," he stated. "Besides, the system was cost-competitive."



The Model 78 was installed in early 1973, replacing a Honeywell G-115. The Keybatch system was added in 1976 to replace card data entry equipment.

Variety of Languages

Cobol is the principal programming language for Anaconda's major applications. However, the New York site has exploited RPG capabilities for a variety of special applications.

Ferrugio said to his knowledge Anaconda is one of the largest users of RPG software among all Data 100 customers: The number of individual programs developed for special reports totals nearly 300.

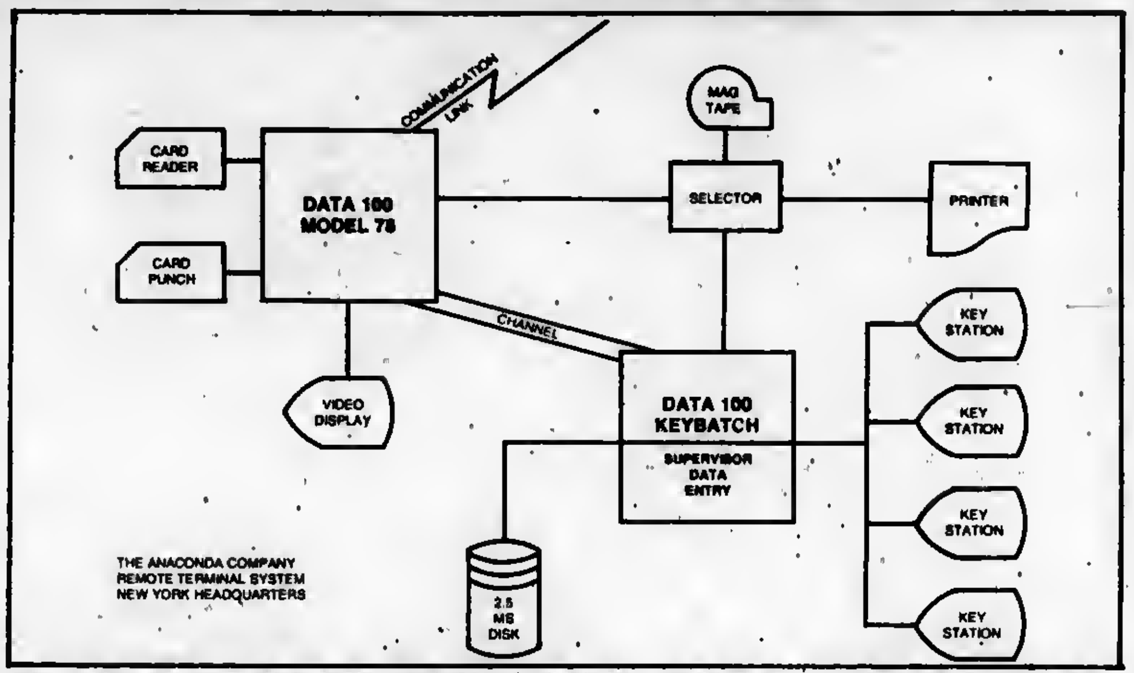
One useful example of RPG software is a telecommunications analysis system developed to help the company make better use of telephone facilities. This system provides analyses of telephone company-provided toll and Wats records, including calling by type (direct dialed, collect, credit card), point-to-point calling and calling by Wats band.

An interesting example is the Inwats analysis. This report is used to determine if a location should provide Inwats service for other Anaconda locations to call it. This report takes advantage of many of the capabilities in RPG for producing a very clear and literate report.

Program Development

The recent frequent communication tariff changes led to the development of a series of RPG programs to analyze those changes so their impact on the company could be predicted. Current rates can be compared with those of previous years for Wats, direct distance dialing, operator-handled and person-to-person calls. Additional programs analyze current rates so they can be effectively applied.

Although most reports generated under Anaconda's personnel system are produced by Cobol or Mark IV programs, RPG has also been used for several other specific cases. The annual budget presentation for upper management is accomplished wholly through the use of RPG. A number of local processing utility programs are written in RPG and reports which analyze system utilization have proven very useful to DP management.



The two systems share all peripheral devices, creating an integrated system with remote batch/data entry capabilities.

RPG is used for most of the data editing and verification, as well as companywide inventory lists for DP and telecommunications equipment. A master list of systems and applications for the entire corporation is also maintained with RPG.

Outstanding Feature

An outstanding feature of the Data 100 system for Anaconda has been its reliability, Ferrugio stated. During the three years the Data 100 system has been in operation in the New York office the total downtime has been no more than three days. This includes time consumed in shifting the equipment twice between locations, he said.

"What's quite amazing," he added, "is that no matter what we do with the equipment, we've never had a problem in getting it up and running. As soon as the various equipment arrived from Minneapolis and was hooked up it worked the first time."

The addition of the Keybatch to the Model 78 remote processing system at the New York office has greatly extended the operation of the New York site. The Keybatch data entry feature has replaced keypunching, thereby saving time and reducing errors in the editing process, Ferrugio noted.

The two systems share all peripheral devices, creating an integrated system with remote batch/data entry capabilities. Ferrugio said this integrated system has the capacity to handle additional jobs for the corporation and the divisions.

Control Facilities Extend Net Efficiency

(Continued from Page S/6)

technical control facility include the full complement of test equipment required to carry out all of the monitoring and test functions associated with preventive maintenance test routines and troubleshooting.

Principle Adhrence a Must

The arrangement of the patching jackfields, switching equipment and test equipment must adhere to basic human engineering principles.

Dealing with circuit problems during peak traffic periods taxes the best of controllers, so the technical control facility must display circuit information clearly, permit the controller to function smoothly in patching and switching operations and introduce no peculiar problems of its own.

The result: increased network efficiency. Downtime is reduced by keeping failure rates low and repair times short. DP management time is maximized by giving the user his data communications money's worth, eliminating the frustrating hours — and dollars — pointing fingers and losing information.

Adams is vice-president of marketing at Spectron Corp. in Moorestown, N.J.

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Net Design Technology Key to Coping With Alternatives

(Continued from Page S/4)

network are optimized by testing various combinations of links among a few selected nodes.

The methods usually begin with a network satisfying all constraints, either selected by a human or generated by computer design program. Exchange methods are then applied until a new network which both satisfies all constraints and has lower cost is found.

This process is repeated until cost can no longer be lowered. The resulting network is said to be "locally optimal."

The process is then repeated using either a new starting network, a different class of exchange methods or the same methods in a different order.

Exchange methods have been applied to the design of both centralized and distributed communication networks. In the design of a centralized network, the problem is to produce a low-cost network connecting the terminals on direct or multidropped lines to a central node (a central computer, a concentrator, a multiplexer or a message-switching processor) subject to constraints on the number of terminals and total traffic in each multidrop line.

Such constraints are necessary to ensure line capacities are not exceeded and the delay time for a response along any given line is kept within desired bounds.

Design Study

To illustrate the potential impact of using modern network design techniques to cope with the combinatorial aspects of the network planning problem, it would be useful to examine the results of a study conducted by Network Analysis Corp. for a centralized network containing roughly 1,500 terminals around the U.S. communicating via multidropped lines to a central processor complex in Hartford, Conn.

This study involved a sequence of optimizations starting with the existing configuration (containing concentrators) and ending with a system using multiplexers and concentrators whose layout was optimized via modern design programs with response time and line loading constraints obtained by using the hybrid simulation/analysis methods discussed above.

The net result (see the following table) was a reduction in cost of approximately 20% with a simultaneous improvement in terminal response time.

Only a few years ago such an improvement in cost and performance would have been impossible. Over the next few years, these techniques will be mandatory for the planning of any complex system because of the difficulty of coping with all of the component and transmission tariff parameters on a manual basis.

Frank is president of Network Analysis Corp. in Glen Cove, N.Y.

(All Designs Contain Concentrators)	Cost (000)	Worst-Case Terminal Response Time (Sec)
1. Original Design	$1,370	37.5
2. Concentrator Deletion	$1,251	37.8
3. Control Unit Constraint	$1,214	21.5
4. Traffic Constraint Based on Analysis	$1,158	6.4
5. Traffic & Control Unit Constraint Based on Hybrid Simulation/Analysis	$1,137	6.8
6. MUX, Traffic & Control Unit Constraints	$1,087	6.9

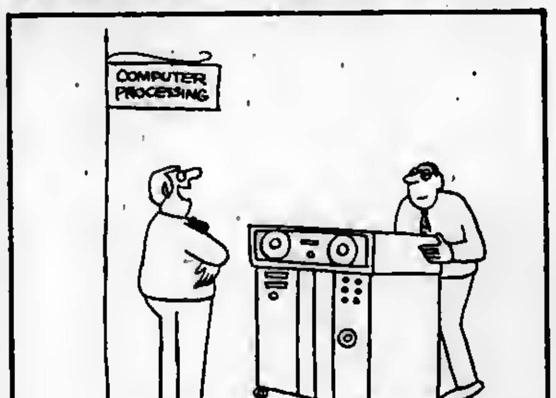
A Sequence of Optimization for a Centralized Design

New Innovations Seen 'More Scarce Today'

(Continued from Page S/5)

will have to average $40/mo and timesharing will have to cost 15 cents/CPU sec or $2/hour of connect time. Centralized and time-shared word processing will have to be further developed, they noted.

All these conditions will probably be met by 1986, Cerf and Curran predicted.



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Investment Must Assure Payoff

After Acceptance, Where Will Retailers Go With POS?

(Continued from Page S/21)

tion. Data communications costs are decreasing while reliability is increasing. Distributed processing, interactive networks and software directed terminals and minicomputers provide flexibility. This is especially true in inventory control and merchandising applications.

For example, a new retail system might use distributed processing techniques in its design, including a programmable store level minicomputer on which a variety of reports can be generated. These reports will help store operating management be more responsive and in better control of individual functions.

Also, modern POS terminals incorporate video displays that increase interactivity between the system and the sales floor. The retail system leads a salesperson through a transaction, enforces transaction procedures as developed by management and permits inquiry to different data bases with the answer displayed on the screen.

The hardware and communications systems that will allow retailers to make further POS activities pay off are available today. Now manufacturers and retailers will have to concentrate on software development to get POS information into a more useful form. Integrated hardware/software communications networks will require highlevel software that can be easily modified and changed by retailer.

Software development to date has been executed on a specific basis — usually for a particular application area and not necessarily tied to current POS interactive operatins. There are good installations which have concentrated on one or two of the following areas: accounts receivable, accounts payable, fashion merchandise, big-ticket inventory and staple stock.

One of today's high payoff application areas is purchase order management. In fact, as an industry buzz word, it has replaced "total management information systems" used a few years ago. Developed properly, big efficiencies can be achieved by reducing the labor intensive operations of tagging, ticketing and auditing merchandise.

And there is the natural follow-through in the control of information that conforms to the retail loop — ordering, receipt, payables, marking, sales and receivables.

Time to Develop

Good applications software takes time to develop. Software development now accounts for the largest portion of any system investment. As a result, the retailer will enhance and expand his system on a building block basis. He will look at each specific operation, decide where he can get the biggest payoffs and then move from there.

Must Be Acceptable

Thus the POS system and equipment users are looking to today must be very adaptable to meet growing and changing requirements. The user must be able to integrate new applications as they become cost-effective or are mandated by legislative changes. He must be able to expand his system in a planned, orderly and economical way. And he must have the ability to fine-tune the information generated by his system to increase profits. That seems to be where we're going and that's how the retailer will justify his future POS investment.

Barnes is vice-president of retail marketing for TRW, communications and systems services, Las Angeles, Calif.

Shipper Planning Data Links for '77

(Continued from Page S/25)

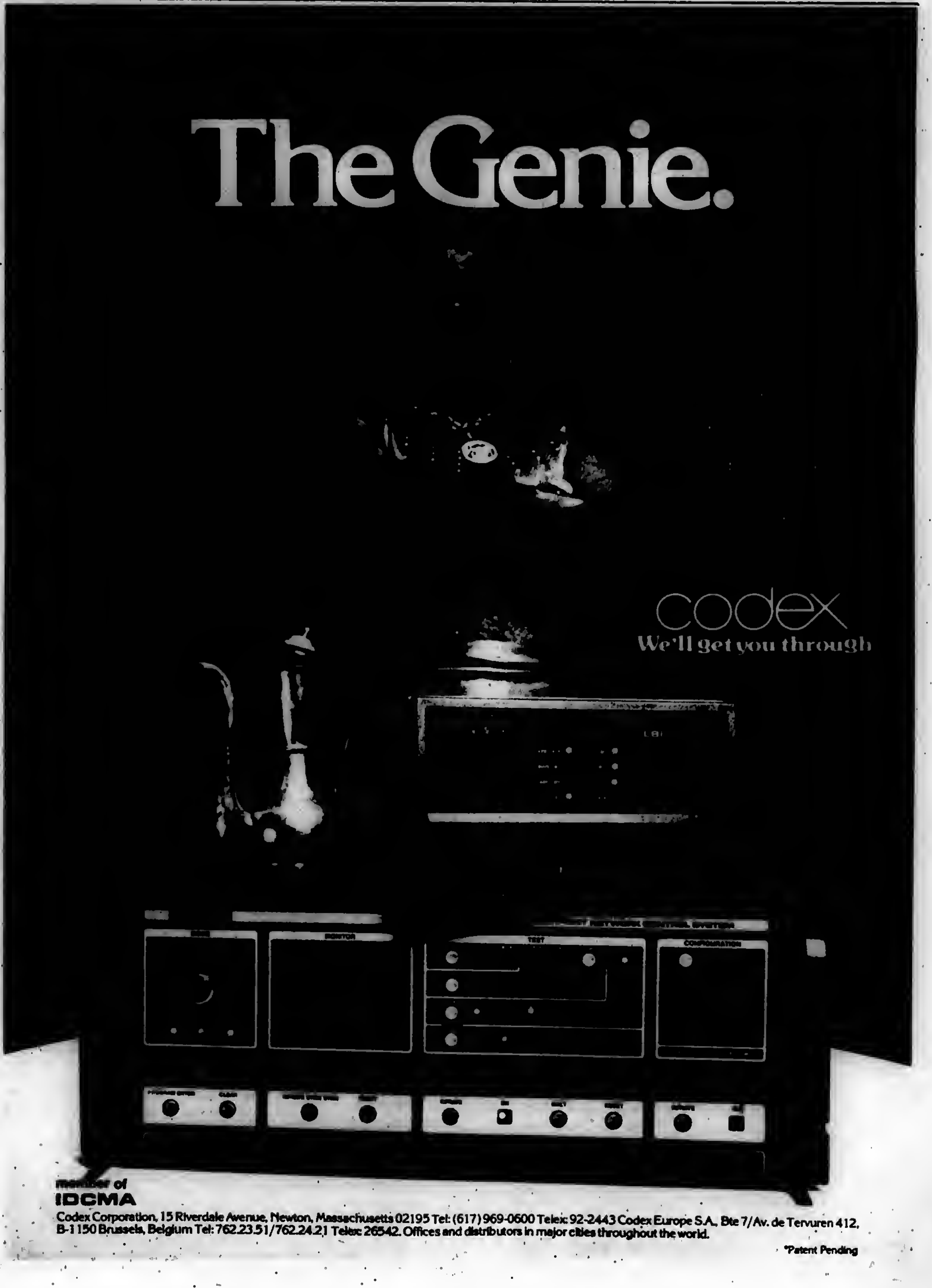
ing centers at approximately $320,000 and said competing small computers might well have cost 40% more.

Development Costs

"The cost of program development was a factor in Wang's favor. Typically, software development costs are about twice the cost of the hardware," he said. "In our case, they are running only about half the cost of the hardware, and we are doing all of our applications programming ourselves.

"We are in a very competitive field. The distributed data base system is helping us provide better service in Europe, but it is also improving our internal controls.

"When the transmission of data begins in February from the 2200 in Rotterdam to the 370/135 here, those internal controls will be even stronger and we will have a much better ability to serve our customers," Keahon said.



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Uses Two 370s, 25 Minis and 480 Terminals

Distributed Processing Net Keeping Mopac on the Track

By Nancy French
Of the CW Staff

CHICAGO – A distributed data processing system is helping the Missouri Pacific Railroad (Mopac) increase freight car utilization and decrease handling errors – both problems that make many railroads unprofitable, according to James A. Shattuck, Mopac's manager of Transportation Control System (TCS) development.

To give a recent conference audience here an idea of how critical a problem underutilization of freight cars is, Shattuck explained only eight out of every 100 freight cars; on the average, are actually loaded and moving toward their destinations at any given time.

The rest, for a variety of reasons, are idle and producing no revenue.

The TCS system – which is actually a control system rather than a management information system – took 130 analysts and programmers about five years to develop and cost $45 million, Shattuck said.

Mopac, one of the nation's few profitable railroads, built the system around two IBM 370/168s located in St. Louis. The mainframe communicates with 480 terminals and 25 minicomputers via 100 communication lines. With the exception of 29 dial-up lines, all are bisynchronous 2,400 bit/sec leased lines.

TCS schedules loaded cars and distributes empty cars. As part of its scheduling operation, the system prepares a "trip plan" for every freight car that describes – before it even leaves the freight yard – exactly how that car should be handled all the way to the customer's siding, Shattuck explained.

The trip plan indicates the train to which the car should be attached, where it sould be "set out" and which other trains should pick it up for the different legs of the trip.

The yardmaster responsible for making up each train obtains information on what is required by accessing a data base maintained in the TCS central computer. He then finds out where in his freight yard the necessary cars are located from a real-time local data base known as the Yard and Terminal System (Yats), maintained in his office, according to Shattuck.

After a train is made up, TCS provides work orders to the conductor indicating everything that must be done en route, including what cars to pick up at various stops and what cars to set off for pick up by other trains.

Car Distribution

The second critical function provided by the system is car distribution and deals only with empty cars, Shattuck said.

When a car is unloaded at a customer's dock, for example, the customer contacts Mopac and "releases" the empty car. This "release empty" information is fed into TCS to obtain the optimum destination for that empty car.

In accordance with rules laid down by the American Association of Railroads and the Interstate Commerce Commission, TCS assigns the empty car an optimum route and destination based on supply and demand.

Simulation tools built into the system assure the plans for individual cars are coordinated with the overall system, Shattuck noted.

Yats maintains a computerized car inventory with the track location of every car. It will automatically determine the next track to which a car should be switched based on car-scheduling information received from TCS, he said.

Track Switch Requests

When the yardmaster decides to switch a track, he uses his CRT to request a switch list on that track. The system displays the list, including the next track assignments for each car, and the yardmaster reviews the list to select the remote printers that will receive the list.

When switching is complete, the exceptions, if any, are recorded and the inventory is updated.

Each of the six largest locations – those with inventories of 2,000 to 6,000 cars – is equipped with two Digital Equipment Corp. PDP-11/50 minicomputers with 128K of memory, three 40M-byte disk drives, 19 DEC VT05 CRTs, 20 Univac DCT-500 remote printers and two DEC LP-11 line printers.

As backup, the peripherals, including some core, can be switched from one mini to the other, Shattuck explained, adding the backup processor acts as a communications front end between the freight yard and the central office.

If the backup goes down, communications can be handled by the remaining processor, he said.

Service centers in 51 locations enable customers to place orders for empty cars, provide shipping requirements, trace or divert car movements and provide bill-of-lading instructions with a single telephone call, he explained.

Customer service centers throughout the 12-state service area which Mopac serves are equipped with 104 Incoterm CRTs emulating IBM 3270s using IBM 2770 protocol. The CRTs are tied into the St. Louis center, he said.

At the general office, 91 IBM 3270 CRTs and 16 IBM 3286 printers are tied into TCS so users can monitor operations, control locomotive fleets, distribute empty cars and report train exceptions such as annulments and extra trains.

Clerks in the accounting department use 24 IBM 3270 CRTs to rate all waybills centrally.

However, since the job of railroad car movement and train makeup activity actually takes place in Mopac's 110 freight yards, computer power has been dispersed to these locations as well, and that's where Yats comes in, Shattuck explained.

Why did Mopac choose a decentralized rather than a centralized approach for its Transportation Control System? See story on Page 38.

The 17 smaller yard locations, with inventories of 300 to 2,000 cars, are each equipped with an 80K DEC PDP-11/40 minicomputer, five to seven VT05 CRTs, two LP-11 line printers, five to 12 Univac DCT-500 remote printers, a fixed-head disk and three 2.5M-byte cartridge disk units.

A key point, according to Shattuck, is that whenever a change is reported to Yats, the same information is automatically forwarded – with no manual intervention – to TCS, and vice versa, to assure cars are not mishandled. Information needed locally, on the other hand, is kept locally.

At the smallest yards, where inventories range from 25 to 100 cars, an intelligent terminal with a display unit, one printer and two diskettes is used to report to TCS and maintain the needed local information.

At the 63 medium-size yards, where inventories range from 100 to 300 cars, a card-oriented system which involves some manual manipulation of cards in cubbyhole systems corresponding to the tracks. is still being used.

A 16K Incoterm SPD-20 equipped with a card reader, card punch, line printer, CRT, two diskettes and up to two Univac DCT-500 printers makes up each of these yards' system.

Besides satisfying central system reporting requirements, Yats has reduced clerical burdens by eliminating the card system used by most railroads in nearly half the yards, Shattuck said. Remote printers and CRTs provide fast access to car information where it is needed, he added, and the system allows local railroad personnel to prepare local management reports.

Scan-Optics Has Scanedit Series Uniting OCR, Key-Entry Systems

E. HARTFORD, Conn. – The Scanedit 300, 600 and 3500 systems from Scan-Optics Corp. are integrated optical character recognition (OCR) and key-entry systems, the vendor said.

The minicomputer-based units, which operate off-line, are connected to each other via a "computer-to-computer" link, presenting users with a system that can concurrently scan, transmit between the parts of the system and perform key-entry tasks, according to a spokesman.

The systems are aimed at users with varying degrees of OCR and key-to-disk requirements, he added.

The Scanedit 300 was designed for the high-volume user with limited video-processing and key-entry needs. The 600 serves such application areas as order entry and inventory control in which users need a moderate number of terminals and increased disk capacity.

The 3500 is suited to users with high-volume image-processing, OCR data capture, key-entry and background-processing requirements.

The 300 can accommodate up to eight CRT terminals; the 600 can accommodate 12 terminals and up to 32 terminals can be linked to the 3500.

A video image is made up of items that cannot be read by the scanner. The image is then stored on disk and displayed at the key-entry operator's CRT for data entry, he noted.

The systems come with a full complement of software, he added.

A basic Scanedit 300 system with either a page or a document reader, 24K bytes of memory, two 9-track tape drives, an I/O console, a 32K Model 1 terminal controller, a CRT, key-entry terminal and 1.4M bytes of disk ranges in cost from $5,100/mo to $7,000/mo on a rental plan. It costs $260,000 to $350,000 to purchase.

The price depends on options and the amount of software and includes the communications link, the spokesman noted.

The Scanedit 600 with a Model 11 terminal, additional disk controller and increased expandability ranges in price from $6,600/mo to $7,200/mo or from $287,000 to $365,000.

The Scanedit 3500 with the basic configuration and a Model 3 terminal controller with 64K words of memory, two CRTs, four key-entry terminals and one 29.2M-byte disk ranges in price from $8,200/mo to $10,500/mo or $414,000 to $520,000.

Scan-Optics is at 22 Prestige Park Circle, E. Hartford, Conn. 06108.

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MACRO PRODUCTS CORPORATION

See printers on display at Dataproducts booth in the NCC Show.

And the Costs of Collection

Authorized Service Helps Merchants Beat Bad Checks

By John P. Hebert
Of the CW Staff

CHARLOTTE, N.C. – Local merchants have stormed to a computer-based check authorization service to reduce large numbers of bad or "rubber" checks from bouncing profits out their doors.

The businesses – large and small – are subscribing to the Checkfax information service because "they always have a handful of returned checks" which are costly and time-consuming to track down, according to C. George Henderson, executive vice-president of the Charlotte Merchants Association (CMA).

CMA's 350 to 400 members, who began using the system last week, hope to reduce by 80% the number of checks taken primarily from the habitual bad-check passer, he said.

There is a two-fold philosophy behind subscribing to Checkfax, Henderson said. First, the service should, to a large extent, eliminate the high costs associated with attempting to collect on a bad check.

To make a rubber check one that is valid, the merchant must first correspond in some way with the passer and advise him of the legal implications of passing a bad check, he explained.

If this fails, the merchant must turn the matter over to law enforcement agencies or turn to a collection agency and possibly seek court action, he said.

Secondly, If the service does cut down on the amount of returned checks, it will make businesses more profitable. Theoretically, Henderson added, those savings could be passed along to the consumer.

Checkfax is a software package and documentation requiring two IBM mainframes – a 7 and a 3/10 – and a tone-type telephone at subscribing retailers, according to the service's developer, Pete Prophit.

The consumer's driver's license number or substitute card from the state motor vehicle department or public safety department is keyed Into the system over dial-up lines, Prophit explained.

The computer system (in Charlotte's case, it is located in Greensboro, N.C.) tells the merchant, in a woman's voice, two things: a personal code rating from 1 to 9 for that particular driver's license number, comprising the check-cashing history, and an activity number, or number of calls made on that check corresponding to that license number in the past 48 hours, he continued.

Armed with this information, the merchant can decide whether to take the person's check. For example, If the person has a "9" for a personal code rating, it would indicate a bad risk because a high activity number, corresponds with a greater risk, he said.

In addition, every subscribing store gets a security number that must be entered via the telephone pad to identify the merchant as a valid user of the system, Prophit added.

The IBM 7 is equipped with a teleprocessing module, 24K of disk storage and a voice response unit.

An IBM 3/10 receives new information from merchants and law enforcement agencies and compiles it on files on a two-hour run every day. The disks, Prophit noted, are then manually swapped from the 3/10 to the 7.

The 3 has IBM 5440 disk packs holding 2.5M bytes each, he added.

Privacy Considerations

Ken Uffman, owner of Checkfax's rights, and Prophit had to make the system conform to Federal Trade Commission requirements on privacy and credit reporting, Prophit said, adding the system is intended solely for check-cashing transactions, requires a merchant security identification code and gives the subscriber no written transaction material.

A merchant could, however, inquire about the check-cashing history of, for example, a prospective employee with the system, Prophit noted, adding It would be against state and federal laws to do so.

Even with those safeguards acting as a deterrent to abuse by subscribers, there is no way to prove a merchant did exactly that, Prophit agreed.

Although the service does list each merchant by individual identification number, the system does not log drivers' licenses which are the subject of retailers' inquiries, he said.

Merchants, on the other hand, have been subject to increasing losses from bad checks for the past couple of years, he said, explaining an increase in white-collar crime, the 1974 recession and the resulting inflation are primary causes for merchants subscribing to Checkfax.

'Fast and Simple'

With Checkfax, a merchant can voluntarily check on a consumer's check-writing history, Prophit said. "It is so fast and simple because the total transaction takes 25 seconds on the telephone."

Stores are "more than willing to save $100 a day by spending $50 each month" – the typical charge for the service, which is available 24 hours every day, he added.

Each inquiry costs the retailer no more than 10 cents and could only cost four cents for high-volume users such as food chains, which make a lot of inquiries.

Public Reaction

Manual efforts could duplicate what the Checkfax service does, but the cost is prohibitively expensive, he added.

When asked about people reacting to a computer system compiling check-writing information on consumers, Henderson said there was no reason for the public to react negatively.

"Computers are everywhere, so what is there to get upset about?" he asked.

"Computers are a way of life" and in the case of Checkfax, the machines are good for people with good ratings, he said, describing the system's advantages.

The Charlotte district attorney looks upon the service favorably, because It will reduce the number of warrants for bad-check passers at Charlotte's police headquarters, which number between 7,000 and 8,000, Henderson said.

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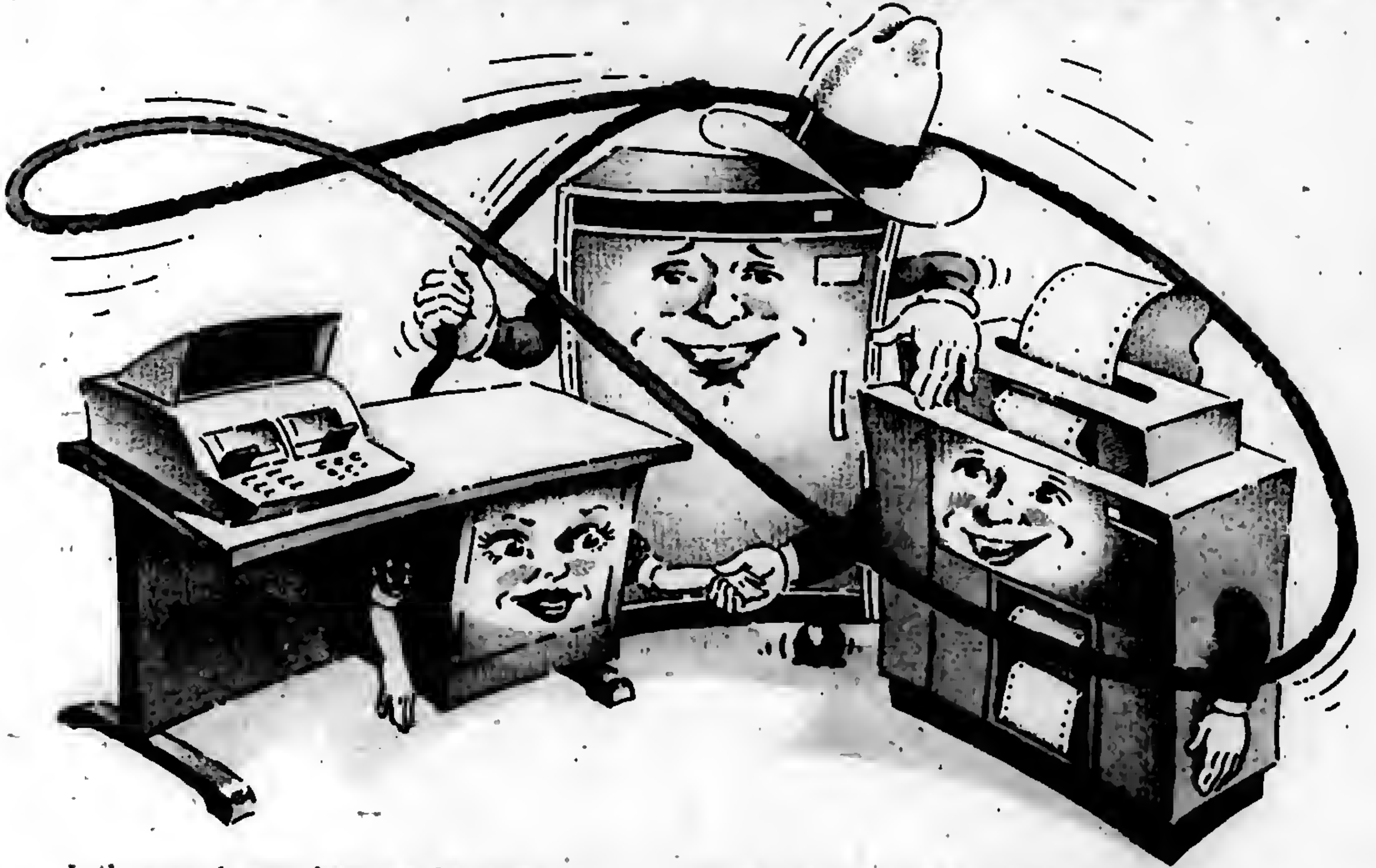

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Mass. Hospital Saving $525/Mo With Microfiche

By Stephen L. Priest
Special to Computerworld

BROCKTON, Mass. – The Brockton Hospital, a 322-bed private nonprofit general hospital here, is realizing a $525/mo savings in paper, DP and man-hour costs by preparing accounts receivable trial balances on microfiche.

Previously multiple copies of six types of trial balances (alpha, numeric, preadmit, financial status, credit and under $5) were prepared weekly and semiweekly.

The voluminous paper, distribution time and computer hours required to prepare and decolate the trial balances cost an average of $997/mo, not including the cost of storing selected trial balances for future reference.

A cost analysis of the way the trial balances were prepared prior to the switch to microfiche against the recently implemented service bureau approach showed that having the computer prepare a magnetic tape containing the trial balances and then sending that tape to a microfiche company would be the best way to go.

Improvements Indicated

The study indicated that Brockton would eliminate paper, significantly reduce DP report preparation time because magnetic tape is several times faster than paper, reduce clerical distribution man-hours and have the reports available sooner than with the paper system.

Also, storage of reference trial balances would stop being a problem.

The hospital decided to go with a service bureau rather than an in-house system on the basis of cost. An in-house system would have cost about $100,000, which was too expensive.

Brockton uses Synergraphics, a COM bureau in Wakefield, Mass. The tape is taken to a bus line which transports it to a location where it is picked up by the service bureau. The completed microfiche is then returned to the hospital.

The magnetic tape is prepared on an NCR C-200 system with 32K of memory disk and tape.

The cost of transporting and producing the microfiche, including the purchase of 10 microfiche viewers amortized over 36 months, averages $472/mo. Thus, the hospital is realizing an average savings of $525/mo using microfiche-prepared accounts receivable trial balances.

Presently other areas of microfiche usage are being investigated.

Priest is manager of data systems at the Brockton Hospital.

Kodak COM Unit Operates On-Line

ROCHESTER, N.Y. – The Eastman Kodak Co. KOM-85 computer output microfilm (COM) unit is designed to operate off-line or on-line to a turnkey minicomputer front-end unit.

The system, which is capable of producing microfilm at 120,000 char./sec transfer rates, offers a variety of reduction ratios and formats, the firm said. Both 16mm and 35mm roll film as well as microfiche in widths of 82.5mm and 105mm can be produced.

In addition, an expanded-page format capability has been optionally added. This allows the microfilmer to create pages that are wider and deeper than the standard 132 char./line by 64 lines per page, the firm said.

Pages with up to 172 char./line and 88 line/page can be filmed, accommodating all existing computer-page formats, the firm noted.

Film cassettes can hold up to 1,000 ft/load, the company added.

Operator control of the size and aspect ratio of characters displayed and filmed is another feature. Independent adjustments for character height and width permit this control, the firm said.

Column Indexing Feature

A column indexing capability that allows the user to place an index above or below each column of pages helps users to locate desired data.

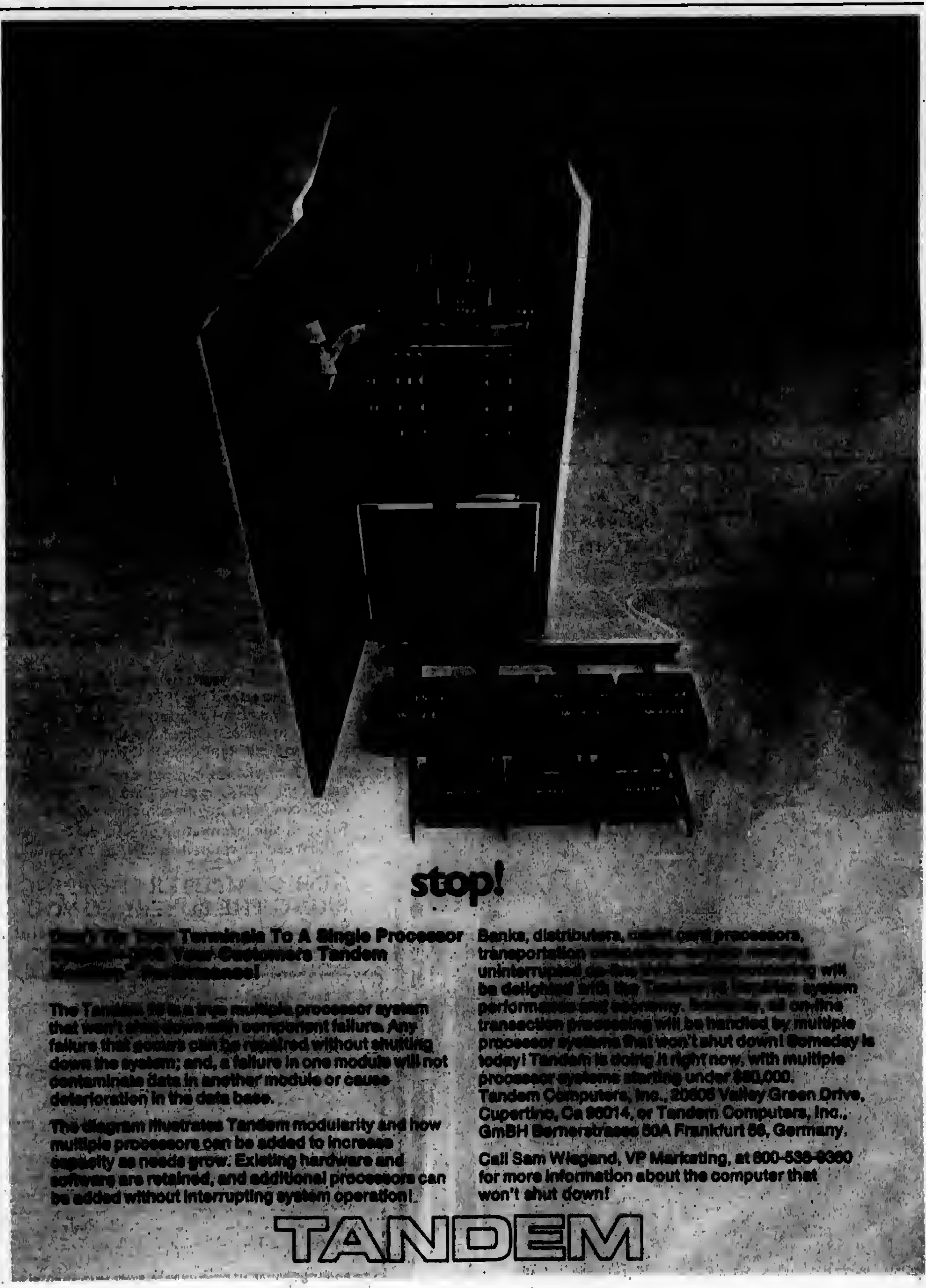
High-contrast fiche titles and "eyeball characters" are achieved by a dense character that does not require overprinting, the company noted.

COM formatting can be handled with Kodak Info-Link software or formatting programs may be written by the user.

A turnkey minicomputer system – the Hewlett-Packard magnetic tape reformatting system – is a front-end system for off-line reformatting of print-image tapes.

The minicomputer system has 32K of memory, an intelligent terminal with two read/write cartridge drives, CRT display and a tape drive. Both seven-track and nine-track tapes from 200 to 1,600 bit/in. in NRZI and PE formats are accepted, the firm said.

The KOM-85 will be available in spring 1977 and costs $116,000, the firm said from 323 State St., Rochester, N.Y. 14650.



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TANDEM

Study Points to Decentralized Approach for Mopac

CHICAGO – The St. Louis-based Missouri Pacific Railroad (Mopac) chose the decentralized rather than the centralized approach for its Transportation Control System (TCS) largely on cost considerations, but not before performing a three-step analysis of the new applications, according to James A. Shattuck, manager of the TCS development project.

The first step was task definition, he said, which involved defining and documenting the objectives of the system and identifying the application tasks needed to reach these objectives.

All interfaces with existing systems also were reviewed and documented, he said.

The second step involved a statistical analysis of transaction volumes based on actual activity which showed the system would exceed 75,000 program loads per day and would process more than three million application file accesses. The total number of messages weas estimated at 130,000 per day containing more than 49 million characters.

Minicomputer and central computer hardware requirements were established from this information, Shattuck said.

The third step comprised an economic and logical analysis of three development strategies: a local minicomputer approach, a central integrated computer approach and a central independent computer approach, Shattuck said.

The central integrated system would have required merging the yard and terminal function into the central TCS design, vastly increasing the complexity of the system, he explained.

It also would have increased development costs and delayed cutover of future phases by 10 to 12 months, he added.

The central independent strategy involved developing the Yard And Terminal System (Yats) on a central computer as an independent subsystem of TCS, Shattuck continued.

This approach would have required only minor modifications to current TCS design without increasing the complexity of the TCS system development, he said.

However, he added, the central hardware to operate the system would have needed upgrading to backup the on-line computer and handle the increased software development requirements.

Communications also would have needed upgrading.

The local minicomputer system strategy adopted was simpler and, in terms of monthly rental prices, was estimated as 95% less costly than either of the two central system approaches, Shattuck said.

More Development Opportunity

The decentralized approach also offered Mopac the opportunity of developing Yats as an independent subsystem without any central system modifications.

The decentralized system can be expanded with greater ease as the need arises, Shattuck said. And, in the event of a central system failure, the independent subsystem can continue to process local functions while offering better response time.

Geac Adds Printer

MARKHAM, Ont. – A receive-only chain printer with controller which accepts print data in serial Ascii form is available from Geac Computer Corp.

The Model 40, which can be remotely operated, comes in friction or tractor-feed formats and has a print speed of 9,600 bit/sec; Geac said.

The controller is pollable, permits full remote computer control of the printer and provides automatic parity error detection, the firm added.

The printer and modem interface costs $5,800 in an 80-column version; the 132-column version costs $7,200. Geac is at 450 Denison St., Markham, Ontario L3R 1B9.

Counter Tells When to Reink

BURLINGTON, Mass. – The Computer Link Corp. line counter was designed to let the user know when to reink a printer ribbon and therefore stretch the ribbon's life.

A Ribbon Management System can avoid wasted time, paper and reruns caused by poor printing resulting from overused ribbons, the company said.

The line counter costs $295 from the firm at 14 Cambridge St., Burlington, Mass. 01803.

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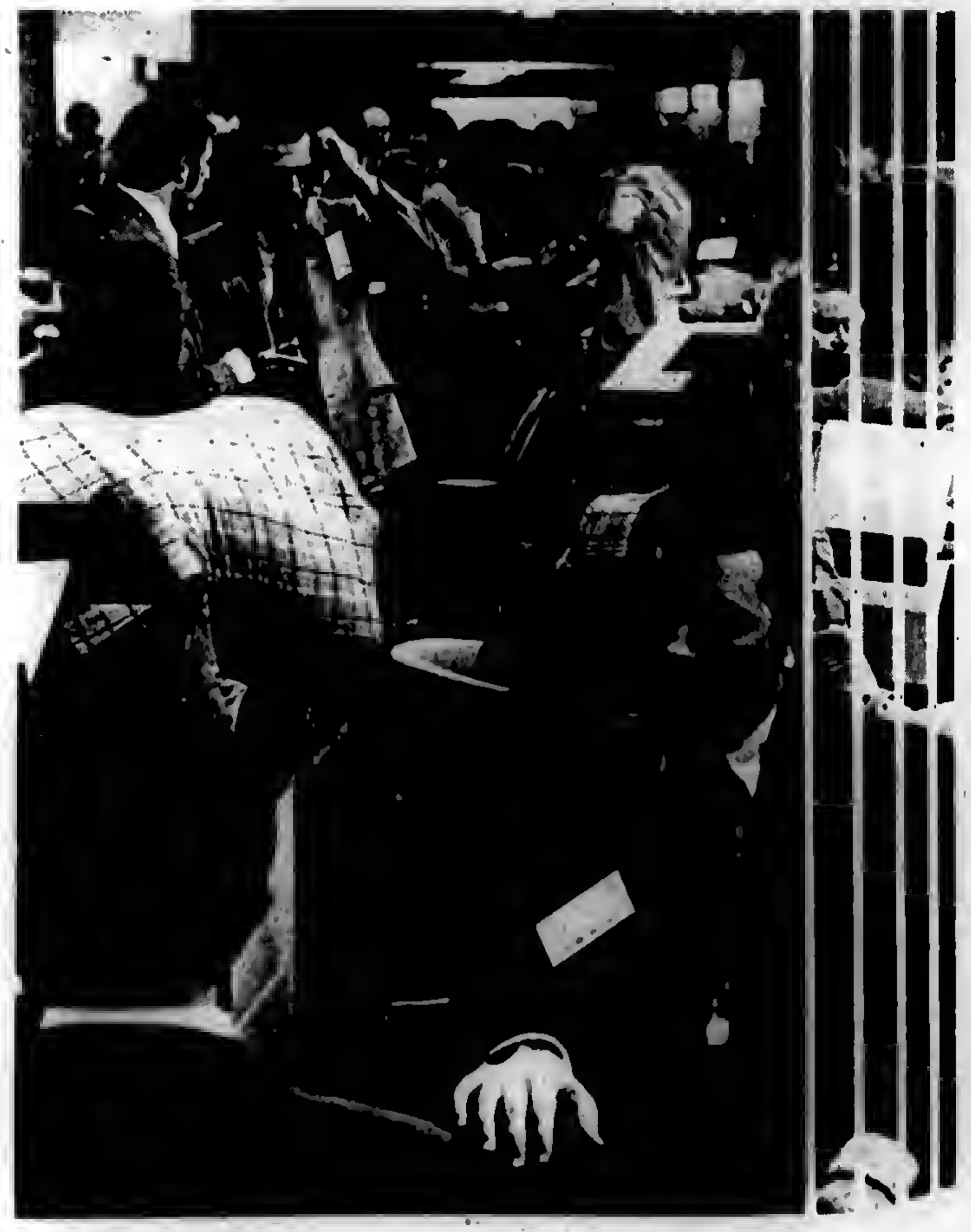

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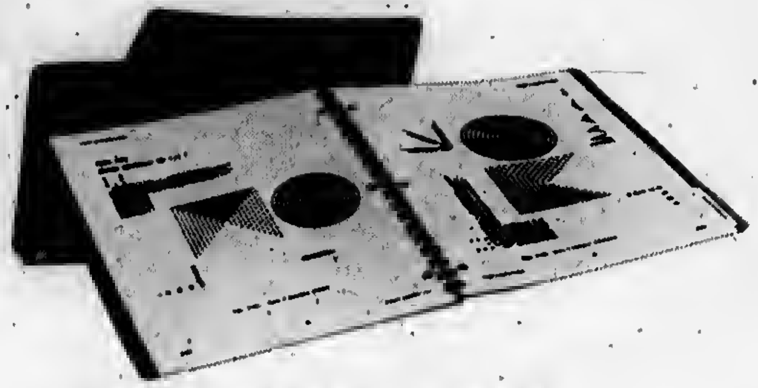

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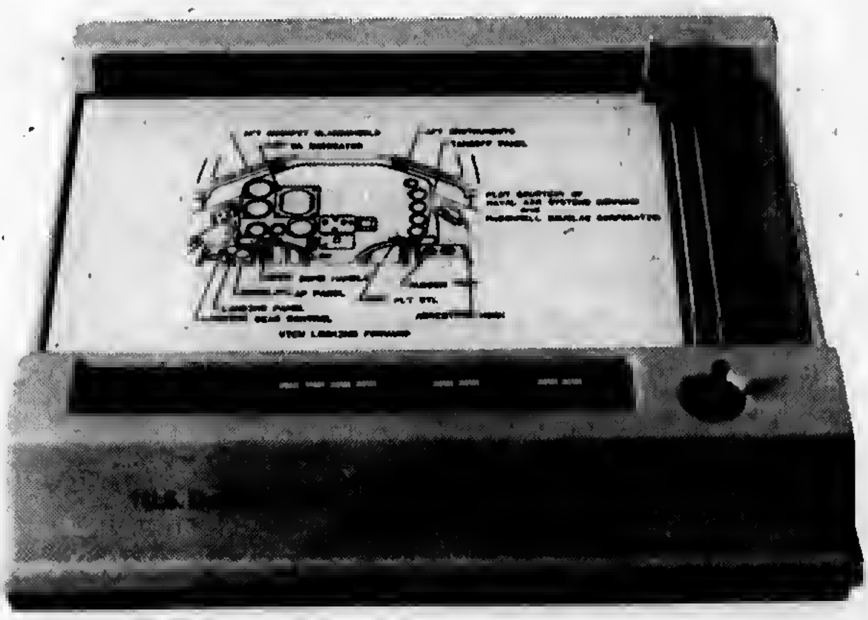

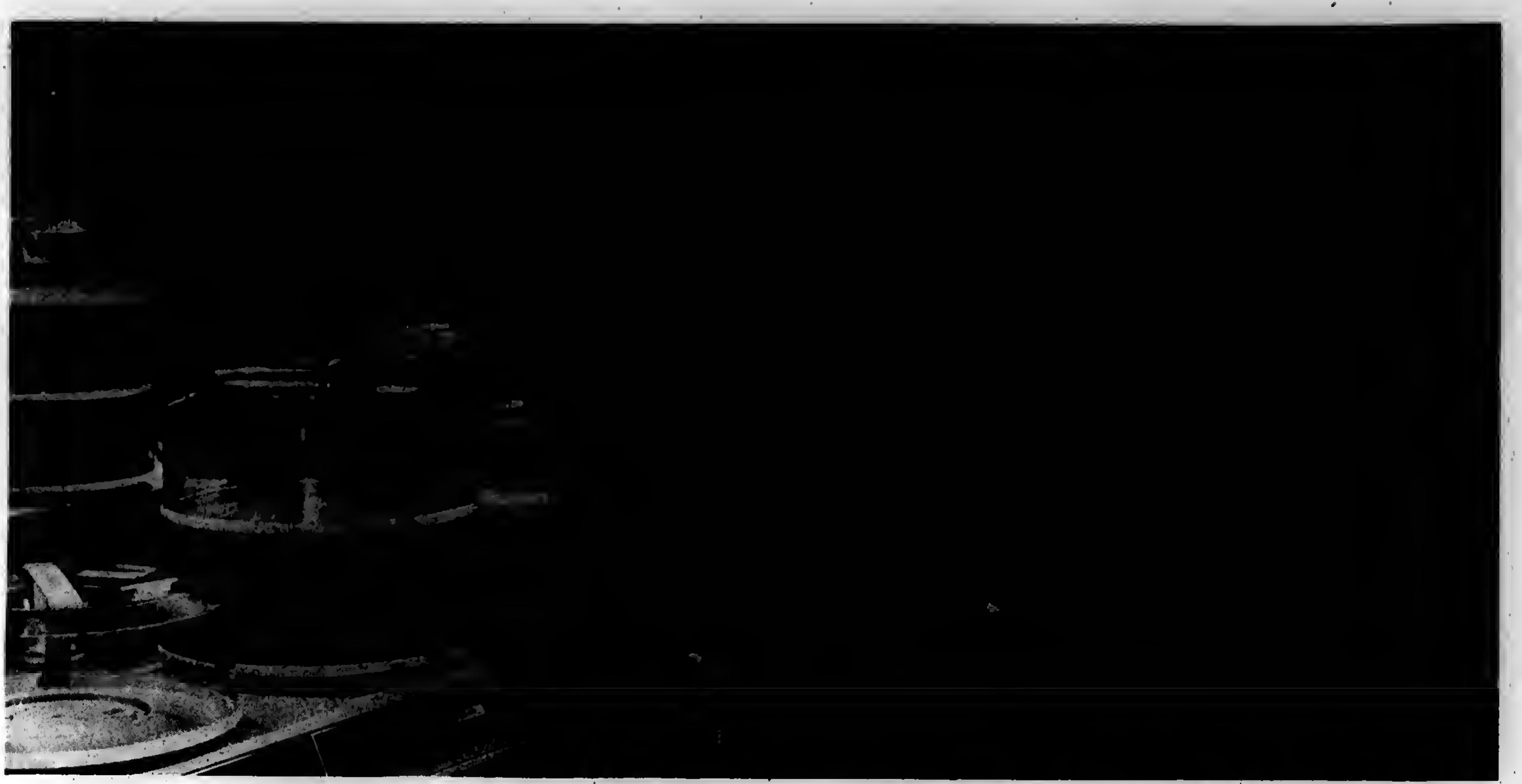

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Mini Bits

Tycom Key-to-Floppy Fits Small IBM Systems

FAIRFIELD, N.J. – An IBM-compatible key-to-floppy disk system has been introduced by Tycom Systems Corp.

The Tycom 3741, consisting of an IBM Selectric, floppy disk unit and electronic console, collects data on the disks which can then be stored or retrieved by means of the Selectric, a CRT or an IBM 5100 portable computer, Model 3741 or System 32, the company said.

The 3741 uses the Ascii format, is Teletype-compatible and RS-232 asynchronous with speeds selectable from 110- to 9,600 bit/sec.

Any Teletype-compatible Ascii terminal can be connected directly to the disk system and can command the disk file, Tycom noted.

A special program sequence can be written for the 5100 to output data continuously from the tape cassette to the disk through the serial I/O adapter, the firm added.

The Tycom 3741 is priced at $7,750, the company said from 26 Just Road, Fairfield, N.J. 07006.

Controller Made for Interdata Use

MOUNTAIN VIEW, Calif. – The TDC803 single-card disk controller from Minicomputer Technology was designed for use with Interdata systems.

The controller, which interfaces to up to four California Computer Products, Inc. (Calcomp) Trident disk drives, occupies one slot in the chassis of an Interdata mini, the firm said.

The TDC803 features sector buffering so it can be operated with or without a selector channel, the company added, and includes rotational position sensing, dual-access capability and an on-board logic probe.

It contains 512 bytes of internal random-access memory (RAM), permitting up to 446 data bytes to be stored per sector, the company noted. The RAM can be expanded to 2K bytes.

The controller comes with cables to the first drive, a diagnostic formatter package and drivers for the Interdata operating system.

The TDC803 costs $1,900, the firm said from 1901 Old Middlefield Way, Mountain View, Calif. 94043.

Electric Utilities Get Turnkey

EVERETT, Mass. – Minicomputer Systems Technology, Inc. (MST) has a turnkey minicomputer system for electric utility companies.

Called A Better Administrative Computer Utility System (Abacus), the system is based on Digital Equipment Corp.'s PDP-11 CPU and MST proprietary applications software developed in DEC's Dibol, the firm said.

Configured around a PDP-11 with 64K bytes of memory, the system can include up to 64 CRTs, up to 88M bytes of disk and one or more printers. Abacus was designed for utilities with from 2,000 to 70,000 accounts, MST said.

The 40-program software package is written in a menu-oriented style that allows users to pick jobs, subjobs or functions from lists on the CRT.

It provides billing, automatic estimating, dunning notices and reports, accounts receivable, ledger card and management reports, MST said.

A basic Abacus costs $50,000 with the price varying according to the configuration. MST is at 137 Ferry St., Everett, Mass. 02149.

Saving About $20,000/Year

Billboard Firm Switches From Batch

By Esther Surden
Of the CW Staff

LOS ANGELES – Switching from a batch-oriented small system to an on-line minicomputer will save Pacific Outdoor Advertising (POA) here an estimated $20,000/year in keypunching costs, according to David Sanford, manager of information systems.

The batch system was "just too expensive," Sanford said. The company's increasing growth and the prospect of the data center becoming the corporate data center for the firm's parent company caused POA to look around for an on-line system.

The POA considered systems from Burroughs, NCR, Digital Equipment Corp., IBM, Varian Data Machines, Univac and Hewlett-Packard (HP) and narrowed the field to DEC, Burroughs, Varian and HP through a request for proposals.

Its decision was made on a variety of criteria including cost, throughput performance, the business-oriented languages available on the systems, operating system capabilities, on-line capacity and the software available for the systems.

Finally, a benchmark was run to determine if the systems could handle a proprietary updating package developed in-house. The results pointed to the HP system, Sanford said.

"Under the NCR Century 101 system, the package took 70 hours a month to perform a major update while the HP system can do it in 20 hours a month," POA found.

Tracking Franchises

The firm owns and manages over 6,000 billboards and hand-painted panels in southern California. Each board is a separate franchise and requires extensive records to keep track of it.

The amount of paint and paper needed for each advertisement also must be monitored and inventory kept in check.

The firm is third-party leasing an HP 3000-II Model 7 with 256K bytes of memory, 150M bytes of disk, a 1,250 line/min printer and 15 terminals. In addition, the programmers have portable terminals at home.

The system costs the firm about $4,700 monthly without the terminals, Sanford reported.

An upgrade to a Model 9 is planned to acquire 512K bytes of memory in the first or second quarter of 1977.

POA is making extensive use of HP's Image data base language and its Query capability, Sanford said. "All systems are being put in a data base," he added.

Conversion to the HP system from the NCR was a large task because "everything had to be redesigned," he said, noting most programs were shifted from batch to on-line.

So far accounts payable, accounts receivable, payroll and part of a proprietary real estate package to be implemented in five stages are running. General ledger should be up by January.

Planned applications include a billboard system to keep track of the cost of operation of the 6,000 bill boards and a merchandising system for signs made for clients whose products appear in supermarkets in southern California, Arizona and Nevada.

Billboard Restrictions

Another system will keep track of restrictions on billboards. "In some cases, if the boards are leased from private people, there are restrictions on how they can be used. For example, some say work can't be done before 8 a.m. and others do not want liquor or tobacco advertised on the signs," Sanford explained.

An extensive data base is maintained of these restrictions, he noted.

Terminals are located in the personnel, financial, operations, leasing, merchandising and management departments as well as in the computer room.

Users can generate their own reports on the screen, saving printing costs, Sanford said. The terminals at the programmers' homes are connected through ordinary 300 bit/sec telephone lines.

The projected savings will be realized in areas such as the elimination of the need for keypunch people and machines, he said.

Eight people work with the system besides Sanford. Although the system is up 24 hours, the computer room is operated only during the day.

User Credits On-Line System With Keeping Lab in Business

By Edith Holmes
Of the CW Staff

COLUMBUS, Ohio – "Our lab is alive today primarily because of our on-line minicomputer system," according to Richard J. Freuler, a research associate with Ohio State University's Aeronautical and Astronautical Research Laboratory (AARL) here.

"The system helped us keep our heads above water during the severe inflation of 1974-75, a time when a number of labs dedicated to fundamental research were phased out," he added.

Just how "alive" is AARL at Ohio State? Well, it helped to calibrate one of the temperature-sensing mechanisms for the recent Viking missions to Mars, Freuler said.

Working under contract for Martin-Marietta Corp., the lab had to test the temperature probe responsible for helping scientists on earth keep Vikings I and II cool enough while entering the low-density, carbon dioxide Martian atmosphere.

"We must have been right in our calculations because both Vikings landed," Freuler stated, adding "we never could have completed this work in the time required with our old analog computer."

The analog system was what AARL had prior to acquiring a Harris Corp. Slash 5 CPU and developing its on-line, real-time data acquisition and reduction system.

Wind tunnel tests of the characteristics of airfoils or airplane wings, the mainstay of the laboratory's experiments, took days to analyze under the old system, Freuler said. Slide rules and hand calculators were used to convert the data gathered by the analog system to usable form.

Since September 1973, when the Harris system was installed, the lab has gathered data in digital form through a real-time front end – an analog-to-digital converter. Freuler noted that data in digital form from the wind tunnel tests can be massaged immediately for results.

In addition to the Harris CPU with 32K words of memory, which Freuler maintained is really a medium- rather than a mini-sized processor, the AARL system presently includes a 300 card/min card reader, a 450 line/min printer, a Teletype 33ASR and a 9,600 bit/sec Tektronix CRT.

Dr. Stuart L. Petrie, the lab's associate director, points out a real-time plot to Richard Freuler.

When the lab selected its system three years ago, it benchmarked equipment from several manufacturers and finally had to choose between systems from Harris and General Automation Corp. The Harris Slash 5 was acquired primarily because of its 24-bit machine capability and the real-time characteristics of its operating system, Freuler said.

The Harris CPU has been used in the Air Force and "has had a pretty good track record," he added.

In the last three years, the lab has had some problems with memory reliability, though not with the cores themselves, Freuler stated.

"The memory system as a whole has caused trouble and the problem appears to be with the backplane connectors," he said, noting "the problem is not severe

(Continued on Page 44)

DEC Announces Cross-Over Units For Datasystem 300, 500 Lines

MAYNARD, Mass. – Two additions to the Digital Equipment Corp. Datasystem family introduced recently give users an upgrade path from the 300 to the 500 line.

Described as crossover systems, both units can be programmed in Dibol-11, DEC's business-oriented programming language, the firm said. The systems are source code-compatible, a spokesman noted.

The top-of-the-line DEC Datasystem 357 is intended for small- and medium-sized businesses that need no more than eight terminals and a single language. The 537 was designed for users who need about a dozen terminals and multiple language programming capability.

Both systems can be used as parts of computer networks, DEC said.

Using the Commercial Transaction System-300 operating system, a typical Datasystem 357 consists of a 64K-byte CPU, two 14M-byte RK06 disk drives, two CRTs and a printer. It costs $55,000.

The Datasystem 537, which uses the CTS-500 operating system, includes a 128K-byte processor, LA36 Decwriter II console, two 14M-byte RK06 disk drives, five CRTs and a printer; it is priced at $75,000.

The systems will be available in the spring, DEC said from Maynard, Mass. 01754.

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All CREATE systems are built from a family of compatible central processors and all are controlled by a uniform, multifunction operating system called PRIMOS. This means you can start with the smallest configuration to handle today's work load, and grow in modular steps to the highest level of performance, without reprogramming. It also means that you can plan on the availability of the power and capacity of Prime's new top-end processor, the model 400. Here are the important specifications:

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There are six entry-level packaged systems in the CREATE series, ranging in price from $35,000 to $200,000. All can be easily expanded with a full range of peripherals, including disks, printers, terminals, electrostatic printer/plotter, unit record devices and data communication controllers.

It's amazing what one Prime computer can do. To find what one can do for you, call or write to: David R. Johnson, Product Manager, Prime Computer Inc., Box 2600, Framingham, MA 01701 (617) 879-2960.

PR1ME

English Urged to Replace 'Claptrap' Documentation

By Esther Surden
Of the CW Staff

SAN FRANCISCO – "It's time we cut out the claptrap you people circulate as documentation," George Plossl of G.W. Plossl & Co. told a group of minicomputer users here recently.

"User documentation should be in English," Plossl emphasized in a speech on minicomputers in manufacturing.

Telling the users the DP department's role in the future will be to manage the data base so everyone can interact with the same data base, Plossl said "there is no way manufacturing concerns such as yours will ever be controlled by the seat-of-the-pants approach used in the past."

Minis and micros, he noted, can provide the systems that will maintain better control.

A common mistake made by system users in the manufacturing end of business is an unrealistic master schedule, he noted.

"Bring in the engineering department," he urged. The engineers are "the greatest consumers of leadtime known to man," but without their help the schedule will break down, he said.

Accurate records are another must if an adequate manufacturing control is to be maintained. "Few people know how bad their records are" because there are no quantitative measures of record completeness, Plossl said.

Without accurate records "you can have a lot of junk coming out" of your system, he warned, and it's the customer who gets hurt when the records are wrong.

But the manufacturing people get hurt in the long run as well with oversupplies or shortages, he pointed out.

Getting the records in order "can be done in a reasonable time and people can be trained to make fewer mistakes," he added.

Training the people may be "the best profit improvement you may make," he said.

On-Line System Credited for Keeping Lab Open

(Continued from Page 41)

and hasn't hampered our work."

Because AARL has "an electronics engineer type" on its staff of 20- to 25 people, "we do our own maintenance and mainframe field modifications, so we haven't called Harris for service often," Freuler said.

When the manufacturer has been called, however, its service has been "good to excellent," he added.

Essentially the lab's full-time DPer, Freuler and an occasional graduate student or two do most of the necessary applications programming using a modified version of the operating system supplied by Harris.

By employing a library of Assembly language subroutines which communicate with the analog-to-digital conversion system, most of the applications can be written in Fortran, Freuler said.

The lab also has Basic, RPG and various other languages available, although Freuler often programs in Assembler.

The research associate characterized the software service relationship with Harris as "the best I've ever run into. I can call Harris up in Ft. Lauderdale, Fla., and, if the problem is serious, it will be solved in a week's time," he said.

Harris "will also call me to see what I think of various fixes and solutions to software problems before it announces them," Freuler added.

Expansion Next Month

Convinced that its computer system is a major key to staying in business – accomplished primarily by attracting federal funds – the lab will upgrade its computer system next month.

Planned additions to its present system are a Harris Slash 6 asynchronous CPU with 64K memory, a 600 nsec cycle time and floating-point hardware; a Harris Model 5530 storage module drive with 80M bytes; Harris model 6690 magnetic tape unit, operating at 75-, 800- and 1,600 bit/in.; a Zeta Model 3640 36-in. drum plotter; three terminals including a Harris Model 8640 alphanumeric CRT, a Digital Equipment Corp. LA36 Decwriter, a Texas Instruments 743 teletypewriter; a synchronous controller; and appropriate remote job entry (RJE) software.

"Initially, all of the duties (and most of the peripherals) of the Slash 5 processor will be taken on by the Slash 6. Then, as appropriate operating system software is developed, some of the real-time data acquisition functions will be restored to the Slash 5 in a dual-processor arrangement," Freuler explained.

The terminals will permit on-line editing of the computation done on data from wind tunnel experiments in addition to RJE to a number of facilities on campus and at the National Aeronautics and Space Administration Langley Research Center, where AARL is under contract to help set up a general aviation airfoil design and analysis center to serve the airline industry on a fee-charge basis.

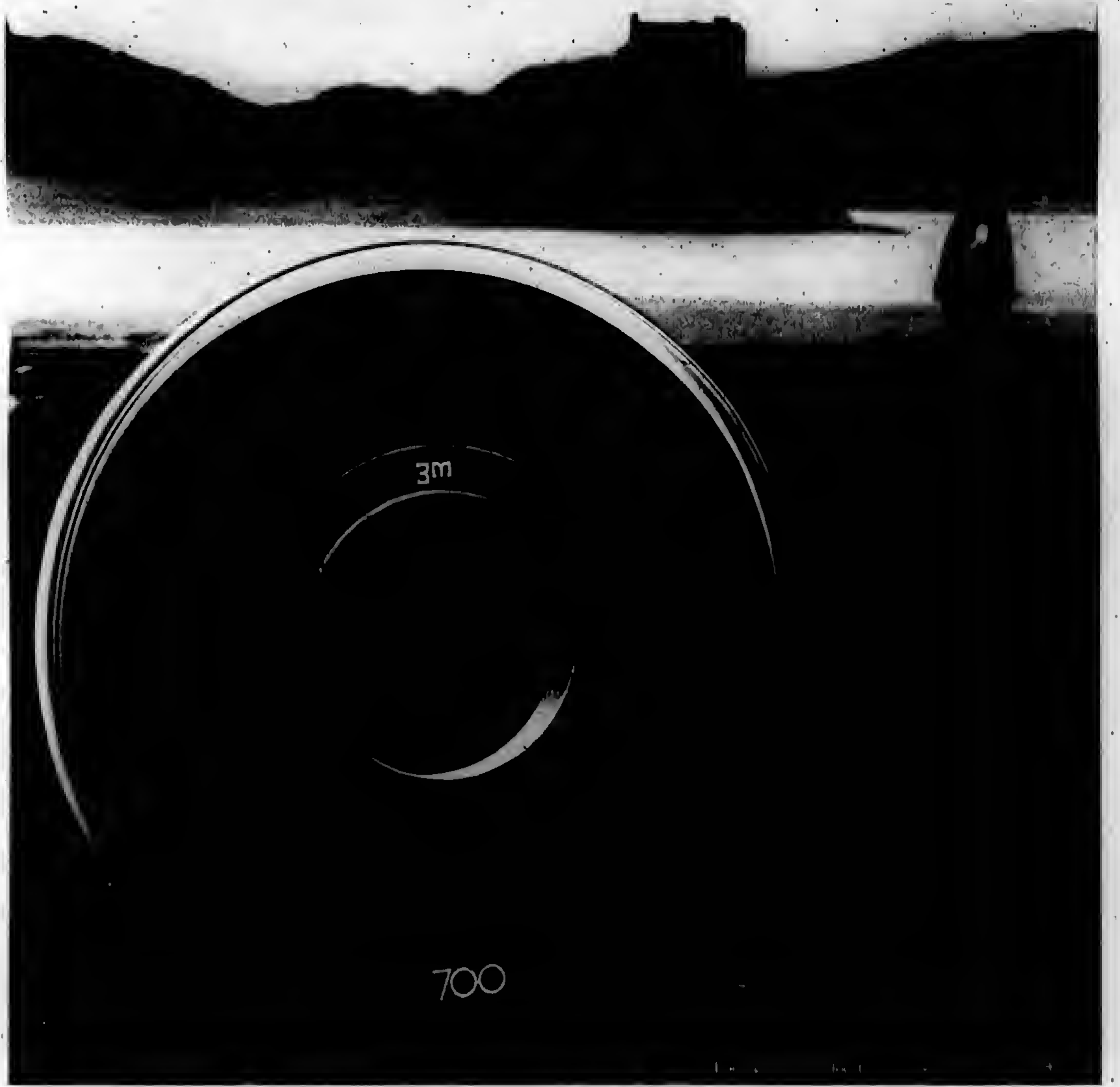
The lab hopes to use its system to continue to develop data acquisition and reduction methods, Freuler stated. In particular, AARL wants to design a digital system that will allow data collection from up to 20 sensor channels in a wind tunnel at speeds of 100,000- to 200,000 sample/sec from each sensor.

No one has ever created a high-speed, multichannel digital data acquisition system before, Freuler said. At best, some conversion systems can collect 100,000 sample/sec from one sensor.

This kind of expanded data acquisition and reduction system would help AARL in its acoustic research and in its study of unsteady pressures for fluttering airplane wings, among other things, he noted.

The system will be "the digital equivalent of a 28-track FM tape recorder and can be built for slightly less money than such a recorder would cost," Freuler added.

And the lab isn't stopping there. In addition to its primary computer system, AARL is developing a real-time digital data acquisition system to go up with small aircraft in flight testing rides.



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Add-On Floppy for DEC PDP-11 Offered by Charles River Data

WALTHAM, Mass. – Charles River Data Systems, Inc. has a floppy disk add-on system for the Digital Equipment Corp. PDP-11 series. The FD11 system is hardware-, software- and media-compatible with the RX11 disk drive, according to a spokesman.

In addition, the FD11 provides write protect switches, unit select switches, 6 msec track-to-track access, modular construction, single Unibus load for up to four drives, programmable read-only memory (Prom) self-diagnostics and a bootstrap loader, he added.

Single Card

The interface, formatter, Prom and other PDP-11 Interface logic is provided on a single "quad" card which plugs directly into one of the processor's peripheral slots.

The FD11 costs $2,500 from Charles River Data Systems at 235 Bear Hill Road, Waltham, Mass. 02154.

Tally Matrix Printer Uses Internal Micro To Compute Distance

KENT, Wash. – A 160 char./sec matrix printer that features bidirectional printing to achieve throughput speeds in excess of 200 line/min has been introduced by Tally Corp.

The Model T-1602 uses an internal microprocessor to compute the shortest distance to the next print position, Tally said.

The unit prints left to right and right to left, slews at 8.5 in./sec and moves the print head at an accelerated rate when not printing, the firm added.

Standard Features

Standard features offered with the Model T-1602 include a 7 by 7 matrix font, double-width character capability, upper/lower case, forms length selection and self-test.

The T-1602 prints an original plus four carbon copies and handles form widths from 4- to 15 in."

A selection of interface controllers for minicomputers, data communications applications and emulation of other printers is available, Tally said.

Prices for the T-1602 start at $3,115. Tally is at 8301 S. 180th St., Kent, Wash. 98031.

PA Designs Printer Series For Micro-Based Systems

SHELTON, Conn. – The DMTP-6 series of printers from Practical Automation, Inc. (PA) was designed for use with microprocessor-based systems, the firm said.

The printers feature a 5 by 7 matrix. They can accommodate paper from 3-7/16-in. wide to 8-1/2-in. wide and can print up to five copies.

Fanfold paper can be alternately accommodated, PA noted.

Effective print rate for the series is 120 char./sec; prices start at $200, PA said from Trap Falls Road, Shelton, Conn. 06484.

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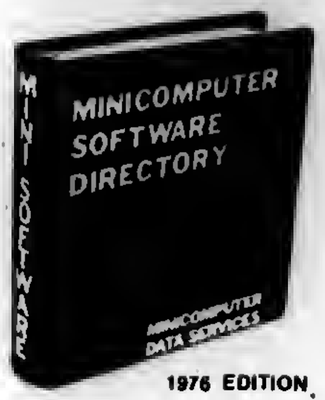

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Interactive Minis in Cartography Lauded

SEATTLE – Although a large-scale computer system can process the data required to produce an accurate map, it cannot match the minicomputer-based system's ability to allow the cartographer to retain artistic control, according to Sam Cook, senior systems analyst at Calma.

No longer do cartographers need programmers to translate their direction into computer language, Cook told a meeting of cartographers here recently.

Detailing the developing use of minicomputer systems in map-making and automated cartography, Cook cited reasons why he believes mini-based interactive graphics systems are growing in popularity with cartographers.

- Such systems have the ability to "structure a data base into a file that may be used for analytical purposes. As a by-product, specialty and thematic maps are easily generated from the digital map file," he said.

Data must be generated from many sources, including manuscript and aerial photography. Therefore, one purpose of the system is source data entry or creation of the digital data base.

"Even the simplest aerial photograph must be interpreted by a user. This interpretation might just as well be combined with data entry, validation and editing.

"The end result is a more accurate digital data base, created in less time with less effort," Cook said.

- "In practical cartography, data must often be distorted for clarity. The large computer will, without outside intervention, reproduce its data precisely to scale with a frequent loss of legibility," the systems analyst said.

"Of course, many programs to automatically distort data have been written with varying degrees of success. But no computer can look at the map and decide where to apply distortion – much less how much distortion is required to guarantee legibility.

"Even worse," Cook said, "such methods are cumbersome to use. The interactive graphics system can easily permit the user to scan the map and say, 'Move the line to here.' "

- Interactive digital graphics systems also permit a cartographer to incorporate data quickly from many sources of varying accuracy and ensure their accuracy, Cook said.

"The interactive editing capabilities alone are sufficient justification for the systems' existence," he claimed.

- "The results of each task are immediately available in the most convenient form (as visual displays) without the necessity to prepare and check program input, submit a computer run and wait for the output," Cook said.

An interactive graphics system typically consists of a minicomputer to operate on digital data, a disk storage system and several terminals or workstations to provide access to the computer and disk.

The terminal includes a graphics display CRT and a digitizer. The digitizer is a means of easily converting a position in space to its numeric equivalent in the computer, Cook explained.

Large computers' limitations coupled with advances in minis have led cartographers in recent years to employ systems enabling them to interact personally with computers in their mapping activities, Cook explained.

"The cost of the modern large-scale digital computer makes its efficient use mandatory. To provide the requisite efficiency, the programs have become more and more sophisticated until only a specialist can use them efficiently.

"The advent of the low-cost minicomputer and 'turnkey' mini-based systems designed to do one function or class of functions has made the computer directly accessible to the user. Minicomputer systems today are used for field data collection, on-site process monitoring and control, computer-aided design, computer-aided drafting and a myriad of other uses.

Interactive tasks that a cartographer can perform personally in conjunction with a computer include area, length, volume and centroid calculations.

Who's number one in PDP-11 subsystems?
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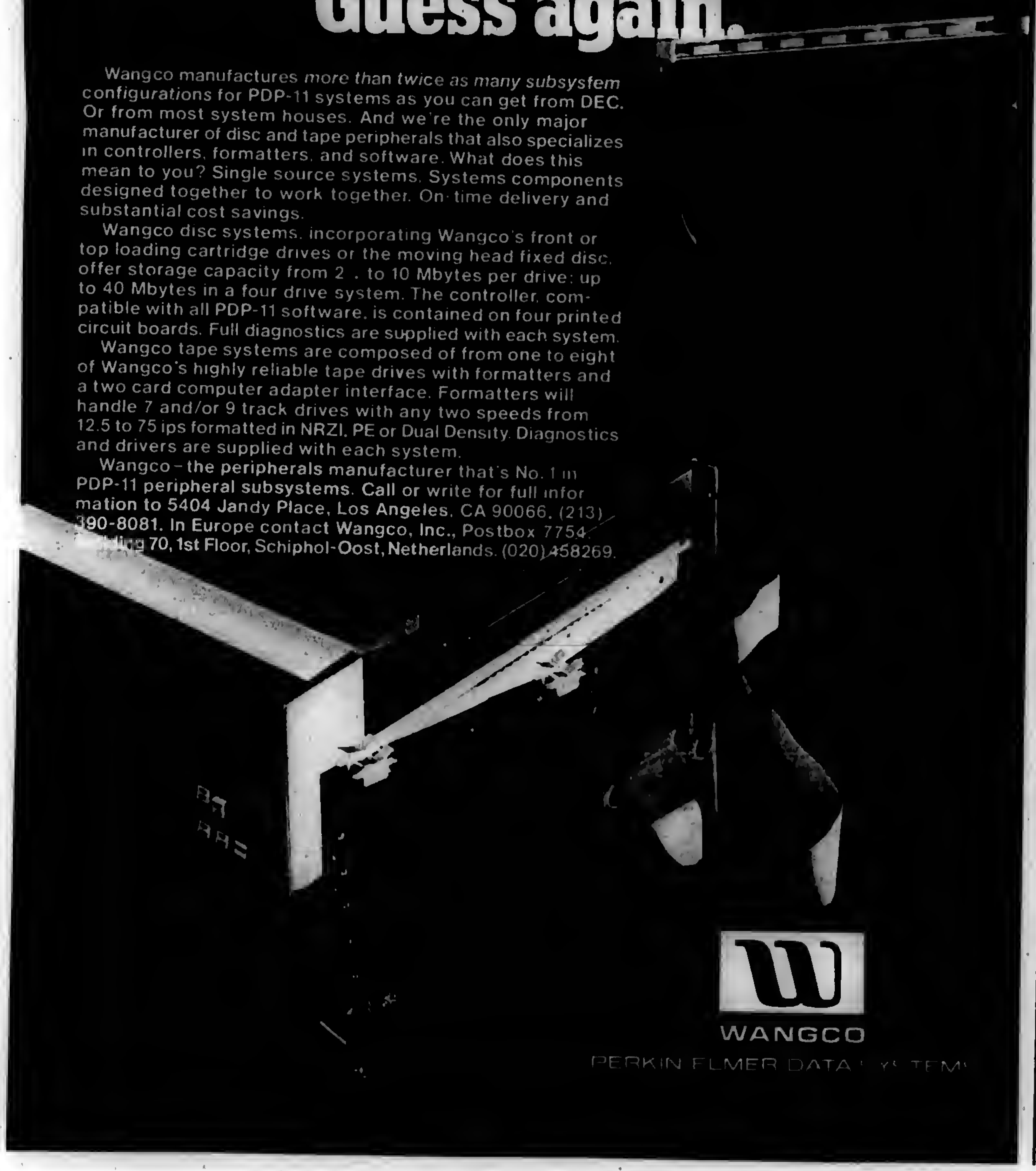

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Wangco disc systems, incorporating Wangco's front or top loading cartridge drives or the moving head fixed disc, offer storage capacity from 2 . to 10 Mbytes per drive; up to 40 Mbytes in a four drive system. The controller, compatible with all PDP-11 software, is contained on four printed circuit boards. Full diagnostics are supplied with each system.

Wangco tape systems are composed of from one to eight of Wangco's highly reliable tape drives with formatters and a two card computer adapter interface. Formatters will handle 7 and/or 9 track drives with any two speeds from 12.5 to 75 ips formatted in NRZI, PE or Dual Density. Diagnostics and drivers are supplied with each system.

Wangco – the peripherals manufacturer that's No. 1 in PDP-11 peripheral subsystems. Call or write for full information to 5404 Jandy Place, Los Angeles, CA 90066. (213) 390-8081. In Europe contact Wangco, Inc., Postbox 7754, ding 70, 1st Floor, Schiphol-Oost, Netherlands. (020) 458269.

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If Mainframers Meet Users' Needs

Value of Installed Systems Seen Double in Five Years

By Toni Wiseman
Of the CW Staff

CHICAGO – Current studies show the installed value of computers in the world will about double in the next five years if the computer manufacturers can produce new systems adequate to meet customers' needs, Frederic G. Withington told a recent meeting here.

These customer needs, according to Withington, senior staff member with Arthur D. Little, Inc., center around a general transition from batch processing to transaction processing, where fast response processing is provided from a data base via a communications network to the point of transaction.

All vendors recognize users will be demanding certain future system requirements, he said, including support of multiple environments, dynamic allocation of resources, automatic memory and file management, high availability and security (integrity, physical security and privacy) and ease of use.

It has become customary to refer to systems having such capabilities as "virtual systems," Withington noted.

"The virtual system is directed entirely in high-level languages and is entirely self-scheduling in the sense of memory, file and communications management," he explained.

"All stimuli presented to this system – run requests, inquiries, transactions for posting and program compilation – will be received by a conversational scheduler which diagnoses any problems in the stimulus, such as JCL errors, and schedules the required operations," he said.

Improved Language

In addition, the conversations with users will be conducted for the most part in an improved command language, closer to natural language than the present ones; new programs and report specifications will be stated by the users in improved versions of present programming languages, Withington stated.

File management, memory allocation, resource allocations and all internal system management functions will be conducted by automatic, universal methods, he said.

While such a high level of virtual system operation is obviously difficult to achieve, a set of hardware and sofware design principles that have seen steadily increasing use should, if well and comprehensively implemented, enable computer vendors to manufacture systems approaching this objective, he said.

These hardware and software principles include automatic communications management, automatic file management, fail-soft, distributed processing, variable stored logic, virtual machines, self-measurement and easier programming.

"These all exist somewhere in some degree; the manufacturer's job is to get them all together and working," Withington said.

'The Hooker'

"But the hooker here is that most of these design principles decrease the efficiency of the system by substituting automatic, inefficient functions for things the user must now do for himself," Withington noted.

"Such systems are likely to be less efficient than those of today because more of the machine's resources will be used in performing housekeeping functions automatically than is now the case," he said.

"Market acceptance of these machines will require improvement in their basic performance per dollar such that their cost-effectiveness proves satisfactory," he added, noting the performance of the machines depends largely on the improvement that can be expected in the hardware components of the systems.

Within the components area, circuits 10 to 50 times faster than today's devices should appear within the next five years, he said. But here again there is a hooker since economies will mainly result from large-scale fabrication.

As a result, Withington predicted, manufacturers, to the degree possible, will use modules at the microprocessor and even higher levels in preference to the design of new specialized circuits."

Memory Chip Design

Similar influences are occurring in the design of memory chips, Withington said, adding that incorporation of associative addressing logic on the chip will become prevalent.

For file storage, Withington predicted hierarchies of auxiliary storage devices will continue to be used through 1985, with the newer technologies appearing first at the high-speed, low-capacity end of the spectrum and then gradually superseding slower technologies as their costs per bit drop.

"Either magnetic bubble or charge-coupled device technology, or both, will be in widespread use by 1983 and are likely to appear in some product lines by 1977," he stated.

He summarized the situation for input/output devices developments by stating there would be little change in electromechanically oriented devices such as punch card handlers and impact printers.

Nonimpact printers, however, have great promise at both ends of the spectrum, he said, as thermal printers are steadily dropping in price and improving in capability at the low end of the price/performance spectrum and electrostatic and ink-jet technologies promise not only higher speed but also greater versatility at the high end.

Computer output microfilm (COM) usage will also increase, he said, and early voice input systems will begin to appear.

In the I/O field, terminals will remain the most important devices, however, with plasma panels slowly gaining on CRTs, which will probably remain the leading technology, he said.

These design principles and

(Continued on Page 50)

President of GSD Notes

Series/1 Marks 'Firsts' for IBM

By Esther Surden
Of the CW Staff

NEW YORK – With the recent introduction of its Series/1, IBM took its first plunge into the minicomputer waters.

The General Systems Division (GSD), which has been concentrating on first-time users and users who needed some handholding, is now going after the sophisticated user who can design his own system and even OEMs.

The Series/1 announcement [CW, Nov. 22] marks several "firsts" for IBM.

For example, it is the first time the GSD has test-marketed a product prior to its announcement, according to C.B. Rogers Jr., IBM vice-president and president of GSD.

The series was test-marketed to provide "insight into the marketplace," Rogers said. "We thought this was an area in which we should move with greater inputs than we had in hand."

The approach of selling the series at a component level is new as well. The traditional unsophisticated end user needed system software, languages and applications packages as well as handholding.

The Series/1 will be sold with a 90-day warranty, although the traditional maintenance plans are available at the usual rates.

With the Series/1, most of the software is not bundled and no applications-oriented products or programming languages are available. It is basically hardware for a systems designer to use to configure a system to suit his application.

In another departure, Rogers said "we would welcome orders from OEMs," adding IBM has not, however, changed its policy of not giving quantity discounts to large users.

"Classically we have been a one-price house," Rogers noted. The "longstanding policy" of treating customers equally no matter how big or small has not been changed, he emphasized.

Nevertheless, "we expect to get business from the OEMs," he continued while acknowledging the Series/1's pricing policy may take it out of the running for many OEM firms interested in large buys.

"There may be situations in which we will not be competitive, but we feel the Series/1 has reliability characteristics and a price that will be attractive."

Other manufacturers' equipment can be interfaced to the Series/1, Rogers added. User-designed interfaces for special equipment are a possibility, as well as the interfacing of the system to other manufacturers' mainframes.

"We would entertain accommodating an RPQ to design such an interface," he said.

"IBM will maintain an unmodified hardware portion of a system configured with other vendors' equipment," he noted, but will not maintain the other equipment.

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The new ADM-3A. From the sublime to the dumb.

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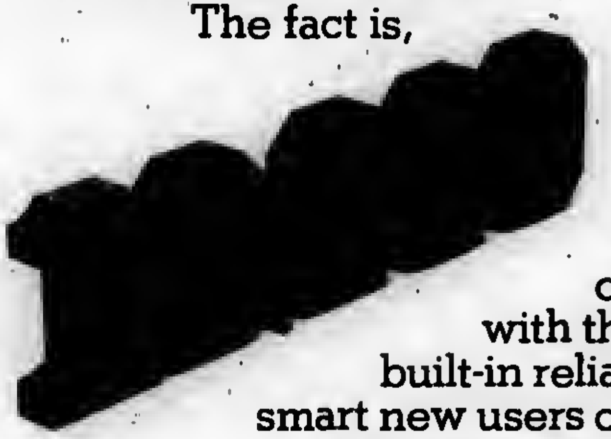

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Memorex Almost Killed Itself by Diversifying: Guzy

By Catherine Arnst
Of the CW Staff

NEW YORK – In an attempt to enter initiative rather than responsive markets in the late 1960s, Memorex almost destroyed itself.

How that happened was explained by James Guzy, former executive vice-president of Memorex, during testimony in the U.S. vs. IBM antitrust trial recently.

Memorex was founded in 1961 as a manufacturer of magnetic tape, an attractive market because there were only two other major vendors of that product at the time, Guzy said.

By the end of 1967, Memorex had captured 40% of that market from those two firms because it offered a lower priced product, he said.

It was then that Memorex wanted to diversify into markets in which it had more control. Memorex management regarded the magnetic media it was manufacturing as "responsive" products because they were developed in "response to what other people were doing," he said.

Magnetic tape had to be manufactured to the specifications set down by systems manufacturers. In addition, since the price of magnetic tape was dropping, so were the profits of its manufacturers.

'Initiative' Products

The company wanted to move into "initiative" products — products which it developed and initiated itself. Memorex planned to diversify its activities into subsidiaries that handled either magnetic media or those products it initiated, Guzy said.

The end result of that plan was meant to be entry into the computer systems market, he explained.

Memorex could see the rapid growth of firms like Control Data Corp. and Digital Equipment Corp. and wanted a part of the greater profits it thought were available in the computer market, he said.

A three-phase strategy was developed to propel Memorex into that market. Phase 1, embarked upon in the spring of 1969, involved entry into the OEM market to raise cash and develop a sales and service capability within Memorex. Its first product was the 630 disk file, meant to attach to the IBM 360/40.

Increase Sales

Phase 1 was intended to increase the firm's sales volume. The objective of Phase 2, started in 1969, was to develop the marketing force absent in Phase 1, Guzy explained.

With this intention in mind, Memorex started the Memorex Sales and Service Corp., he said.

During Phase 2, Memorex introduced a number of products. It expanded its disk file line to include the 660, 661, 670 and 671; it developed the 1270 communications controller and hard-copy printing terminal; and it marketed the 1603, a microfilm system with attendant peripheral equipment.

System Development

At the same time Phase 2 was being undertaken, Memorex started developing a small computer system as a replacement for its 1270 communications system. It was meant to be a competitor of IBM's 360/40 and was aimed directly at 360/20 users.

Memorex's objective with its systems, designated the models 40 and 50, was to design a computer for approximately $200,000 that could handle a number of varied tasks without a complicated software system. Advanced semiconductor technology was used to design such a machine, Guzy said.

The system was designed but Memorex still faced the problem of financing it. Phase 1 of its strategy was meant to raise cash to finance Phase 2 and a leasing subsidiary was also organized for that purpose.

Capital was still needed from external sources, however, to bankroll Phase 3, Guzy said. Memorex wanted to raise $200 million from banks and other financial institutions and Memorex would invest $20 million.

Only $19 million of that $200 million was ever raised, he said.

The Monkey Wrench

The monkey wrench in Memorex's strategy was external: IBM's announcement of its 370 line, Guzy claimed.

"It had a major impact on our financing program . . . financiers asked, "Are you competitive?' " Guzy said.

In addition, IBM announced a number of products that were in direct competition with Memorex offerings and usually at a lower price.

The IBM 2319 disk file and the 3705 communications controller were both announced at reduced prices from previous products. Both had the result of destroying the market for Memorex's 660 disk file and 1270 controller, its two major OEM products, Guzy said.

In the first half of 1972, Memorex was installing 50 of its 1270 systems per month; its output in the third quarter was "virtually nil" for the same product and the 660 was being phased out of production, Guzy said.

Other Problems

Memorex had a number of other problems as well. It discovered the OEM market had a problem absorbing the number of products it had planned on because of the recession, Guzy said.

Also, IBM brought a trade secrets suit against Memorex in 1970 that was settled out of court with prejudice to IBM, he said.

Delivery of the System 40 began in the fall of 1972, and sales were meeting Memorex's predictions of having 40 installed by year end, he said.

These sales were not enough to bail the company out, however, he added. The cessation of its other products had left Memorex short of incoming capital and it owed the Bank of America approximately $100 million.

Finally, Memorex ceased production of its computer system, the first initiative product it developed, in June 1973, he said.

Systems Value Seen Doubling

(Continued from Page 47)

component improvements will be combined into a variety of commercially available system configurations for small and large systems, he said.

"Both will apparently use wideband digital buses through which communications between system elements take place. Both will use numerous individual processors for particular functions, each processor having its momentary identity determined by the stored logic contained in it," Withington predicted.

The specialized processors will have equal access to a commonly shared memory, however, so the operation of the entire system will appear monolithic.

Both small and large systems will separate control functions from computation ones, using at least one separate machine for automatic file control, communications control and/or input/output control, he added.

Each of the component processors in the small system will have a manufacturing cost of at most a few hundred dollars, conceptually similar to today's microprocessor but with substantially more power, he stated.

"In the larger system, however, the component processors used will have much more power, perhaps equivalent to today's IBM 370/168, but with a manufacturing cost in the tens of thousands of dollars," he predicted.

In the small system a 1M byte/sec transmission rate may well be adequate, while in the large system 50M byte/sec may be required, he said, adding that fiber optic technology seems a possibility for the main bus function in large computers.

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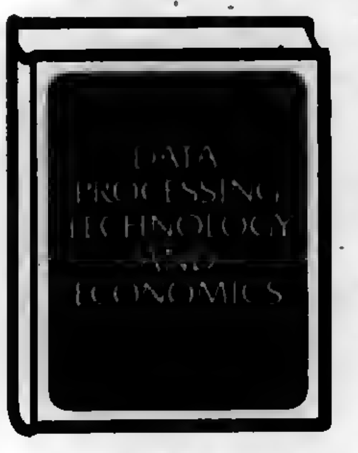

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CDC's China Sale Seen Focusing Western Attention

By Bohdan O. Szuprowicz

Special to Computerworld

The recent decision by President Ford to approve the sale to People's Republic of China of two Control Data Corp. (CDC) Cyber 172 computers once again focuses the attention of computer manufacturers on potential future markets in China.

Approval of the $5 million sale comes on the heels of a recent announcement by Hitachi Ltd. of Japan that the China National Machinery Import and Export Corp. has ordered two large Hitac computers worth approximately $8.6 million for the Central Meteorological Bureau in Peking.

So far China has not been a significant purchaser of Western computers, but since 1973 annual shipments reported under the Standard Industrial Trade Classification code 714, which includes office machines, computers and calculators, have been increasing and totaled $2.6 million in 1974, the last year from which complete statistics are available.

Japan was predictably the leading exporter accounting for 50% of the total in 1974 but France, the United Kingdom, West Germany, Italy, Denmark and the U.S. also show some exports to China.

In previous years other countries such as Czechoslovakia, Norway and Austria also exported some office equipment to China but in most cases these were small one-time shipments in the order of $100,000 each.

China first gained the attention of Western computer manufacturers in 1965 when rumors began circulating in the West that it tried to obtain an IBM Stretch computer, by way of France, to support its developing nuclear program.

In that year China also began purchasing Western computers. In 1966 an Elliott Electric 803 computer was purchased for a medical research organization but the biggest sales of that day were an International Computers Ltd. (ICL) 1903 and 1905 which were shipped to undisclosed customers in 1967. At that time no British personnel were allowed to enter China to help with the installation but a group of Chinese programmers and engineers were trained by ICL in the UK.

Since the 1960's China is believed to have acquired a Honeywell-Bull Gamma 3 computer, a Data General Nova minicomputer made under license by Nippon Minicomputer in Japan and a Redifon R-2000 machine as part of the Boeing 707 flight simulator system. In 1974 Compagnie Internationale d'Informatique (CII) and Honeywell-Bull participated in a French National Exhibition in Peking and sold an Iris 50 and an HB 61/60 which they had on display there.

In October 1973 Geo Space of Canada Ltd., a subsidiary of Applied Magnetics of Goleta, Calif., received a $5.5 million order for computer equipment and seismic data recording systems which were delivered to China in 1975.

The two CDC Cyber 172 computers have been sold to China by the Compagnie Generale de Geophysique of France also as components of a larger seismic exploration system. The sale met opposition from the Pentagon and other government agencies on the grounds the CDC computers were capable of being used for military as well as industrial purposes, particularly for support of radar systems and analysis of nuclear tests.

International News

Ford's decision to override all objections and approve the sale is also seen as a deliberate gesture of support for the new leadership in China.

China has also pursued a policy of "self-sufficiency" and has been building its own computers. It supported a viable electronics industry which has developed to the point where China is considered to be the second largest manufacturer of radio receivers in the world after U.S. Since 1958 at least 20 different computer models have been built in China several of which are third generation machines in serial production.

Nevertheless potential markets for large sophisticated machines appear to exist in China, some within such organizations as the Meteorological service, while others exist within the 600 basic industrial enterprises which the Chinese planners conceived as the backbone of the Chinese industrialization program as far back as 1949.

About 300 of these basic plants were designed and many were built with Soviet and East European assistance. Today most of those plants are old enterprises which must be modernized to deliver the efficiency required of an industrializing country.

Since 1972 almost 100 plants were purchased by China from 11 different countries and the CDC Cyber 172 computers are in fact components of one such plant purchase. If China pursues this policy of rapid industrialization and with increasing availability of petroleum for export to earn hard currencies, future computer markets in China can be expected to develop to a more significant level.

Szuprowicz is president of 21sth Century Research.

Survey Shows 60% of Japanese Users Plan Upgrades Within Three Years

TOKYO – A recent survey of over 1,000 firms in Japan revealed that more than 60% are planning computer equipment upgrades within three years.

The survey, conducted by Japan Electronic Computer Co. (JECC), showed that 28.7% of the users are planning upgrades within a year, 18.1% will do so within two years and 20.5% within three years.

Of those planning to upgrade within a year, 67.9% are going to commit more money to hardware costs, while 28% will pay the same while upgrading and 4.1% will reduce their expenditures.

JECC noted that the later the users planned to upgrade, the more funds they tend to commit to the move.

JECC also questioned users about their plans to install major advanced equipment or I/O devices within three years.

Intelligent terminals showed the highest installation rate, 18.4%, among the users while 14.5% intended to install floppy disks; 10%, key-to-disk units and 4.9% 1,000 to 3,000 line/min impact printers.

"It is interesting that both IBM 3850 or comparable mass storage systems and non-impact high speed printers with performance of 3,000 to 12,000 line/min are to be installed by 24 companies or 2.3% of the repliers," JECC noted.

The survey found the ratio of investment in DP hardware to annual sales volumes averaged 0.15%, up from 0.13% in 1974.

By industry segment, DP service bureaus were found to be making the largest investments, 16.73%, inordinately larger than the next closest, securities business, whose investment ratio was only 1.46%.

Foreign Orders & Installations

Mount Isa Mines Ltd. of Australia has ordered a Univac 1100/12 system to handle on-line cost and budget, workshop scheduling and production control applications for its sub-level caving and mining operations.

Control Systems, S.P.A. has ordered two Input 80 systems from Recognition Equipment Italia, S.P.A., to be used for processing quarterly wage and salary information for the Italian social security system.

RCA Corp. has installed Comten, Inc. data communications systems in Liege, Belgium, and Sunbury, England.

The Burton Group, a U.K. clothing firm, has ordered a Univac 90/60 for its London data center.

The General Mutual Insurance of French Police has installed Inforex, Inc. System 5000 file management equipment, including four disk drives and eight terminals, at its DP center.

AEG-Telefunken of Frankfurt, West Germany, has ordered an OP-1 system, valued at $10 million, from Ontel Corp.

The UK's Royal Air Force computer center at Innsworth, Gloucester, has installed a 2970 system from International Computers Ltd. for the Royal Air Force Personnel Services System.

Avco-Dallah of Saudi Arabia has ordered minicomputer-based flight information systems from Conrac Corp. for installation at eight airports.

Hokkaido Electric Power Co. Ltd. has ordered a Univac 1100/42 system from Nippon Univac Kaisha, Ltd. to be used primarily for real-time distribution, inquiry, on-line sales information and a charge assessment system.

The Nederlandse Credietbank N.V. has ordered Bank Control System 90 equipment from Bunker Ramo Electronic Data Systems GmbH.

El Mundo, Inc., Puerto Rican newspaper publisher, has ordered a Honeywell Level 62/60 system for media advertising accounting, circulation, reporting, accounts receivable and payroll applications.

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Back from the Brink: Insyte Shows It Can Be Done

By Molly Upton
Of the CW Staff

TORONTO – Going from $600,000 debt to a debt-free position with net worth of nearly $1 million in four years with no external financing can be done.

Insyte Corp., following a plan engineered by Ben Ronn, president, has done it.

Now positioned in the data base software market and the related applications market, the firm intends to expand, either through acquisition or internal growth, Ronn said.

Insyte has undergone several stages of growth in Ronn's attempts to make it a self sustaining profitable venture.

Insyte Corp. now includes three DP-oriented firms as well as real-estate ventures, and has about 85 employees.

Computer Information Management Co. (CIM) supplies the Datacom/DB and Datacom/DC data base packages, while Information Company of America (ICA) provides scientific bibliographic documentation and information processing along with translation services.

Mauchly Wood Systems Corp., an information management consulting firm, also supports Datacom and other CIM products.

Real Estate

One vehicle Ronn used to advantage was real estate investments.

In 1976 Insyte gained about 50% of its revenues from real estate, but Ronn said this should decrease to about 30% in 1977.

Earnings should follow the same trend as the firm's software products assume a larger role in the company's support, he said.

Ronn arrived at 3i Corp. in 1972. At the end of the fiscal year in June the firm, which was in library science type services to the medical area, had revenues of $500,000, a $1 million loss on operations and $4 million in writeoffs.

Some Wall Street parties that held interests in both 3i and Mauchly Wood Systems Corp., a contract programming firm, engineered the merger of the two firms. Neither firm had ever earned any money, Ronn said.

Ronn fired 60 of the 70 3i employees and set to work taking advantage of 3i's public status, he said.

The firm went through a reorganization, in which Insyte Corp. was made a holding company, chartered in Delaware, and 3i was merged into it on a five to one reverse split. There was no injection of any cash, he added.

'Tried to Stay Alive'

The firm sold assets on its books for about $95,000, traded debt for equity in another company and converted some debentures into small debt, he said.

"We tried to stay alive."

After a first quarter loss of $400,000 in 1972, the firm ended the year with a reduced loss of between $150,000 and $200,000.

Various 3i products were transferred to ICA.

In 1973, Ronn said, he couldn't borrow money, so he "backed into real estate," parlaying the $400,000 in tax credits to generate cash through buying and selling apartment houses in Houston.

Built Equity

Insyte built equity in the projects and formed a management service company for them that is still operative and generating revenues, he said.

"We recognized the opportunity, took advantage and adopted it," he said.

Then when it had some funds, it bought Computer Information Management, a five-year-old firm that developed Data Com, a data base management package.

In September 1974, Ken Parker joined the firm as president of CIM. Revenue has tripled and the profitability is excellent, Ronn said.

CIM had less than 30 installations in 1974 and now has over 125, he said.

Mauchly Wood is a support organization for CIM and also sells application software designed for use with data bases.

Insyte is "prepared to take advantage of the industry momentum in both the systems and application area," Ronn said.

Putting the pieces together in a synergism "wasn't divine guidance, but we were cognizant of developments and the pieces fell in place," he said.

The firm has realized its goal from the real estate portion, and Ronn said he doesn't expect further growth in the transaction area, but does expect some from operations.

Substantial growth should come from the information group, he said.

IBM Price Actions May Help Industry, Broker Predicts

NEW YORK – IBM's recent pricing moves evidenced on its 370/138 and 148 and the other mainframers' price reshufflings will not "have a destructive impact on the industry's profitability," according to a report from L.F. Rothschild & Co., an investment and brokerage house here.

Since other mainframers are also utilizing the advances in semiconductor technology, Rothschild said it is confident their gross margins are higher despite the lower per function pricing inherent in state-of-the-art products.

It cited the belief that manufacturing costs are cut in half when the density of semiconductor components is doubled.

Maintenance Price Hike

Of significance also is the price hike levied by IBM in maintenance rates, which thus allows others leeway in their pricing, the report observed.

"If we accept the fact that the profitability enjoyed by non-IBM mainframe vendors has historically been hampered by the costs associated with: (1) high proportions of leased equipment; (2) providing field engineering; and (3) software support, we believe that the current environment strongly favors a general reduction in profit pressures industrywide," the report said.

The reduction in IBM's sales/lease ratio reflects the more rapid escalation of costs in the rental sector of the business, Rothschild surmised.

A continuing trend toward a higher ratio of purchased machine shipments would bode well for the industry's profitability, the report indicated.

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As the once-in-a-lifetime U.S. Bicentennial approaches its demise, it's time to sit back and look beneath the headlines for the truly significant events of 1976. Beyond those tall ships, giant cakes and candidates, what really happened to shape and direct this historic year? If you're involved with computers, you'll find answers that affect you in *Computerworld's* Year-End Review and Forecast, appearing in the special, combined issue of December 27/January 3.

Edited by E. Drake Lundell, this special issue will be filled with useful analysis and insightful commentary on the year's most compelling computer stories. To name just a few items, this report will cover the latest developments in computer hardware, software and communications; the effect that recent (and pending) legal decisions and/or federal policy revisions may have on the industry as a whole; and the way computers are changing our society. In addition, a variety of experts will be on hand to help shake the dust from *Computerworld's* crystal ball, and give you knowledgable forecasts of important events that are likely to occur in 1977. It's all coming your way December 27th -- and if you're involved with computers, you'll find articles, newsnotes, commentary and summary that will interest and inform you.

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Orders & Installations

Allied Bank of Houston has ordered two Trace check processing systems from Recognition Equipment, Inc.

General Portland, Inc., cement supplier, has installed an Inforex, Inc. data communications network linking eight division offices. The equipment includes a 1303-II key-to-disk system with two keystations at corporate headquarters and a 1300 control unit with as many as four keystations and a 200 line/min printer at each division office.

The Phoenix-based Farm and Home Life Insurance Co. has ordered a Honeywell Level 64/20 system to expand its accounting functions, agent performance records and policy status reporting.

McDonald's Corp. has begun installing customized point-of-sale (POS) systems from Courier Terminal Systems, Inc. in several of its more than 4,000 restaurants.

Orchard Supply Co. of Sacramento, Calif. has installed a Burroughs Corp. B700 system for accounting, payroll, invoicing and inventory control applications.

Shell Oil Co. has ordered a computerized process control system, including hardware and Fortran Language Industrial Control (FLIC) software from Metromation, Inc. to reduce consumption of energy at its Martinez, Calif. manufacturing complex.

La Vogue, a Richmond, Va., women's specialty shop, has ordered a Univac 90/30 system for on-line order entry and credit authorization, payroll processing and general accounting.

The Louisville Trust Bank, Inc. has ordered a Burroughs version of Automated Financial Systems, Inc.'s commercial loan information system.

Susquehanna Broadcasting Co. has ordered an NCR Criterion system to be used for processing cable TV system accounts, music scheduling for the company's FM radio stations and on-line order entry for its manufacturing division.

The U.S. Air Force has ordered an IBM 370/168 for one-year lease to headquarters of the Strategic Air Command for support of its expanded mission and war planning requirements, as directed by the National Command Authorities and the Joint Chiefs of Staff.

Richard Cabot Associates has ordered six OEM systems from Microdata Corp. for turnkey customers.

The U.S. Navy has ordered an AN/UYK-30 16-bit military microcomputer from Hughes Aircraft Co. to be partitioned onto six Standard Electronic Modules (SEMs) at the Naval Avionics Facility in Indianapolis.

The U.S. Navy has ordered digital-to-resolver converters from North Atlantic Industries, Inc.

Towle Manufacturing Co., manufacturer of silver products, has ordered a Univac 90/30 system.

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Our attractive starting salaries are commensurate with experience and will provide ample opportunity to move forward in a pleasant working environment.

Please send resume in confidence for our immediate review. Please include salary history. Reply to:

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---

position announcements

SOFTWARE SPECIALIST

W.N.Y. profitable mfr. needs analyst for customer support. Install. & modify software systems; industry exp req'd. Real-time scientific applications on PDP eqpmt. $20,000 (fee paid). Contact P. Seigal (in confidence).

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position announcements

COMPUTER CENTER DIRECTOR

Continuing full-time Administrative & Professional position. Responsibilities of administration of Center; leadership in planning and coordination; direct staff; develop and administer annual budget. Master's degree in appropriate field, 5 years experience in computing at college and director level; Knowledge of third-generation systems. Zerox Sigma-series equipment experience desireble. Submit curriculum vitae by December 10, 1976 to James Powell, Provost, Oberlin College, Oberline, Ohio 44074. To be filled no later than July 1, 1977. Annual salary range $21,000 to $26,000. *Affirmative Action (M/F) Equal Opportunity Employer*

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Data Processing Careers, Inc
Suite 1106
Stemmons Tower West
Dallas, Texas 75207
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Electronic Systems Personnel
1705 Fisher Building
Detroit, Michigan 48202
FLORIDA
Data Sciences Personnel, Inc.
Suite 205
15490 N. W. 7th Avenue
Miami, Florida 33169
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Los Angeles, California 90010
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426 Forbes Avenue
Pittsburgh, Pennsylvania 15219

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Providence, Rhode Island 02903
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The Computer Resources Group Agency, Inc.
303 Sacramento Street
San Francisco, California 94111
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CFA Associates Personnel, Inc. (Agency)
2530 James Street
Syracuse, New York 13206
TULSA
Data Processing Careers, Inc.
Suite 10, Park 21 Building
2626 East 21st Street
Tulsa, Oklahoma 74114
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FSP Systems Corporation
Suite 210
1211 Connecticut Avenue N.W.
Washington, D.C. 20036

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Minimum of 5 years experience in implementation of a data base management, operating or communications system. High degree of visibility within the organization reporting to the Advanced Development Manager.

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3 to 5 years experience with emphasis in:
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- Discrete, Digital and Linear IC's

DESIGN AUTOMATION ENGINEER

- BSEE degree with minimum of 3 to 5 years experience.
- Familiar with Fortran, Logic Simulation, Systems Simulation, P.C. Board Design, and Automated Bill of Materials.

COMMUNICATIONS SYSTEMS ENGINEERS

A degree in engineering, computer science or equivalent is required with preference being an advanced degree. An EBA would be a substantial asset. Applicant must have strong systems orientation and substantial experience with communication systems. In-depth knowledge in one or more of the following areas are desired:
- Operating System Provisions toward communication, including communication access methods.
- Communication processor architecture.
- Communication link disciplines.
- Communication systems diagnostics.

Send resume including salary history to: Max Anderson, Professional Placement, Dept. CN, 3718 N. Rock Road, Wichita, Kansas 67226.

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IMS-II & IMS/VS people, both DB and/or DC, are needed up and down the coast.

Systems Programmers, IMS Internals, IMS Externals, Data Base Managers, Telecommunications, Tech Specialists, Software Systems Analysts, IMS Performance Analyst, Software/Hardware Evaluation Specialist, Application Analyst, and more.

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Available Jan. 1977. Applicants must have Masters in Computer Operations, Data Processing, or other Computer Science discipline. Individuals must be able to teach all levels of courses in any 2 of the 3 areas above. Candidates should have related working experience and/or 1 year teaching experience. Starting salary $10-$14,000. Respond in writing only to: Mercer County Community College, Personnel Services Dept. CS, Box B, Trenton, N.J. 08690. Equal Opportunity/Affirmative Action Employer.

$16,000 to $18,000
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Expanding major oil Co. seeks person with 2-3 yrs. mini exper. Prefer DEC, HP, VARIAN, or Interdata hardware bkgd. You will be trained as a hard/software planning analyst. You would be one of the key figures in the future directions planning group. This Co. has 2) 370/158-JES-3, MVS, IMS & 21 mini-computers + 4) 360's & a Dual CDC 6600.

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Immediate openings are for:

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- **Analysts/Programmers**
  Develop, implement, and maintain information or data systems. Prefer three or more years experience with information or data systems, working knowledge of 360/370 hardware, COBOL or FORTRAN, OS/JCL programming. U.S. citizenship required.
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  Design, analyze and develop physical or logical data base applications. Prefer three or more years experience with IMS on large scale hardware. U.S. citizenship required.
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  Application Analysis, System Design and Software Analysis assignments involving evaluation of mini applications for data entry and Data Base management; design of mini business systems; and development, maintenance and preparation of comparative analyses of mini software and operating systems. Prefer experience with current generation of mini and IBM 370 systems. U.S. citizenship required.

Please send your résumé to The Boeing Company, P.O. Box 3707-TCU, Seattle, WA 98124.

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BCS BOEING COMPUTER SERVICES INC

PROGRAMMER ANALYST

We want career people with growth potential. We are a rapidly growing professional date processing company located in Jacksonville, Florida, the "Bold New City of the South". B.S. Degree in Computer Science. Methematics or Engineering required. Minimum 1 year experience in ANS COBOL plus e working knowledge of OS JCL. Send resume, in confidence, with salary requirements and availability date to Mr. A.W. Flack, Computer Power, Inc., 661 Riverside Avenue, Suite 110 East, Jacksonville, Florida 32204, or call (904) 358-1424.

SYSTEMS ANALYST
CAROLINAS - $20-22,000

Highly attractive Carolina location, Fortune 500 mfg firm needs severel systems analysts to develop & implement a highly sophisticated, corp-wide human resource information system. Reqs degree, solid COBOL/370/OOS programming exp and severel yrs systems analysis exp with personnel/payroll related systems. Excellent benefits & continued career growth potential. All employment costs paid by client co. Contact in conf. J. Schwab (704) 527-4980 or send resume to:

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For immediate and confidential consideration, please call:

Robert Paddock
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Resumes may be sent to his attention at 10880 Wilshire Blvd., Suite 2110
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COMPUTER SYSTEMS

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Central N.J. educational institution requires an individual with a minimum of 4 years E.O.P. experience including 2 years of programming, and 2 years system design and analysis gained in an OS-MVT, COBOL environment. Starting salary $15,223. Excellent benefit package. Qualified cendidates send resume to:

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SYSTEMS PROGRAMMER ANALYST

Seeking an experienced systems programmer to work in a small group mainteining and enhancing a 370/145 VS1 TP and batch system in a college environment. Minimum requirements include a computer-related college degree and one year of OS or VS SYSGEN/maintenance/modification/troubleshooting experience. Salary sterts at $15,638 with good fringe benefits. Send your resume by 12/31/76 to: Jeff Billin, University of Idaho, Computer Services, Moscow, IO 83843. The University of Ideho is an EEO/AA employer.

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- **Support Software Design and Development**
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These assignments are for command and control, avionics and related applications on a wide range of aerospace products.

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Attractive salary, fringe benefits and moving allowances will be offered qualified candidates. Living is a pleasure in the unspoiled Northwest with its many recreational and sports activities and relaxed life styles.

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A fast growing unit of local government that is home to the University of North Carolina (at Chapel Hill) is organizing a data processing department. We ara looking for someone with experiance to head this agency. Prior government employment would be helpful but is not necessary. Tha salary is not fixed but will be commensurate with applicant's experience. A generous fringe benefit packaga is provided.

Contact: S.M. Gattis
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SENIOR SYSTEMS ENGINEER

CBT's Data Processing Department has an excellent opportunity available for a proven performer with 3-5 years technical experience.

Our current operating environment includes the following:

OS/VS2 release 3 on 370/158 MP system

Candidates should have knowledge of external and internal operating systems and be able to maintain a current MVS system. Knowledge of TCAM and TSO is also desirable.

Please submit resume, which includes salary history and expectations to Steven Bell, Manager Professional Recruitment.

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Computing

DIRECTOR OF COMPUTING

The University of California at Irvine is seeking a Director of Computing who will report to the Vice Chancellor for academic affairs. Will be responsible for planning and management of campus computing including a computer facility which has a staff of 14 and a budget of $1 million. The campus is heavily committed to instructional computing and the facility operates largely in an interactive mode. Annual salary is $22,300 - $31,500. Candidates should have demonstrative management ability and technical competence in computing, an advanced degree and directly related experience in the work to be performed. A background in academic computing is preferred.

Applications must be received by December 17, 1976. Please send resume, salary history and the names of 3 references to:

Professor Stephen White,
Chairman of the Search Committee
c/o Personnel Office
152 Administration Bldg.
University of California Irvine
California 92717

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APPLICATION and TECHNICAL PROGRAMMERS

These openings are due to an expanded scope of data processing objectives including an accelerated Material Control Program.

Here is your opportunity to join an organization that is being geared for productivity and results. We are providing our users with current data using On-Line Systems, with a corporate data base for economy and a network of communications for efficiency. Our company has a performance oriented management that provides challenge and opportunity for personal growth in all functional areas. Selected candidates should have 2-3 years working experience of COBOL or ALC. Our hardware/software environment is IBM 370/158, VSI operating system. We are migrating to MVS, IMS and TSO, experience in these areas is a definite plus.

Send complete resume with salary history to: Mr. Jerry Hope

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- Evaluate current user requirements and anticipate future needs in software and hardware.
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- Supervise supporting staff activities.
- Promote professional development of supporting staff.

A Master's degree in Computer Science or an equivalent combination of education and experience is necessary.

Send resume to: **Dr. Bobby R. Brown, University Computer Center, 229 Lindquist Center for Measurement, University of Iowa, Iowa City, IA 52242.**

Senior Systems Programmers

Develop, install and maintain system software on the computing Center's DEC system-10, IBM 370, and PDP-11 computers, and assist students, faculty and staff in their use.

A degree and considerable relevant experience is required with one or more of these machines. A thorough understanding of operating system internals and teleprocessing principles is essential. Additional experience with programmable communication controllers for IBM 370 and DECsystem-10 is desirable.

Send cover letter and resume to Personnel Department, Skytop Offices, Syracuse University, Syracuse, New York 13210 by December 1, 1976. *An Equal Opportunity, Affirmative Action Employer M/F.*

"HEALTH CARE SYSTEMS PERSONNEL"

The Medical College of Virginia Hospitals (MCVH), a 100 Bed Teaching Hospital located in Richmond, Virginia, is in the process of procuring a Full-Scale (Level 3) Hospital Information System (HIS). To aid in the detailed planning installation, and ongoing requirements of this effort, MCVH is seeking qualified individuals for the position (s) of Application Specialist/Senior Analyst (Three (3) positions available); and one (1) HIS Systems Development Project Leader. Persons to be considered for these positions should possess the following minimum qualifications:

1. Two to four years experience as a Systems Analyst, with one to two of these years as a Project Leader on a major application in the Health Care Field.
2. A Bachelors Degree in Data Processing, Accounting, or Health Care related fields (Advanced degrees desirable).
3. A high degree or proficiency in communications both verbally and in writing.

All qualified applicants are invited to forward a confidential resume' including salary requirements and personal references to: Director of Personnel, P.O. Box 66, 1220 E. Marshall Street, Richmond, Virginia 23298.
An Equal Opportunity Employer.

PROGRAMMER ANALYST SYSTEMS

Oakland County is seeking a select employee for a key technical position in systems programming. Applicants must have at least four years, within the last five years, of full-time paid work experience in software systems programming, including at least two years running CICS or VM in a DOS or OS/VS 1 environment.

Oakland County is in the midst of rapidly expanding its teleprocessing system which serves County government and many units of local government, including a 23 agency law enforcement information network, and will begin a conversion from DOS/VS to OS/VS1 this fall.

Salary range: $17,715-$19,671. Beginning salary is dependent upon applicability of prior experience and qualifications. The salary is supplemented by an outstanding fringe benefit package.

Applications will be accepted until further notice.

For additional information or to obtain the necessary application materials, please contact:

The Personnel Department
OAKLAND COUNTY
1200 N. Telegraph Rd.
Pontiac, MI 48053
Phone: (313) 858-0530
A Merit System,
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County Executive

DATA COMMUNICATION SYSTEMS ENGINEERS

To evaluate data communication module and equipment for applicability in Retail Point-of-Sale terminal systems. Will generate standards for data communication circuit handshaking and will provide future communication products. To provide support for data communication system analysis and proposals for future retail systems.

Candidates should bring a degree and a good understanding of Binary Synchronous (BSC), ANSI Asynchronous and SDLC Control procedures. Knowledge of Modems, Communication adapters, and Communication procedures essential and a knowledge of Common Carrier facilities desirable.

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To define system requirements involving real-time POS micro/mini computer systems.

Both positions involve the conceptual design, performance analysis and critical performance/cost trade-offs; one will amphasize the software system elements, the other the hardware elements.

An experience range of from 4-7 years in planning, design, analysis, and documentation of on-line, real-time systems mixed with some detail design work in both hardware and software development will meet the challenge of these 2 senior openings in our Advanced Development group along with your degree in engineering/computer science.

NCR's Point-of-Sale organization is expanding to meet the demands of the exploding POS market.

NCR's P.O.S. facility is located in a lovely, rural community in east central Ohio.

We invite you to respond as soon as practical.

Robert W. Donovan
Terminal Systems Division-Cambridge
NCR Corporation
Cambridge, Ohio 43725
(614) 439-0398

NCR

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Manager

Corporate Information Processing

This is a senior and highly visible corporate level position requiring a tough, no-nonsense manager and technical leader who has the ability to lead, organize and motivate a highly qualified technical and operating staff and steer a state-of-the-art data center into the next century. You will direct the activity of the Data Center and the Service Organization with primary responsibilities to provide corporate wide consulting services to applications managers and users and to ensure adequate hardware and manpower capacity necessary to provide timely and quality service to support central software engineering and MIS functions.

Ideally, you will have a state-of-the-art technical background in managing a large time-sharing production facility in support of software engineering and MIS activities. Equally important you must be an aggressive planner and negotiator with demonstrated ability addressing the needs of users.

If you are seeking an opportunity to utilize your ability to the fullest in an unprecedented growth situation, we invite you to investigate this position.

Forward resume outlining salary requirements to Barry Bograd, Digital Equipment Corporation, Dept. G1129, 162 Main Street, Maynard, Massachusetts 01754.

digital

digital equipment corporation

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SYSTEMS ANALYST

Particioata in major expansion of MIS dapt w/dynamic E. Mass mfg co. Several positions currantly availabla for eggressive indiv's w/solid COBOL prog & provan systems design exp in the areas of mfg, mktg, ordar entry, acctg/finance. Salary to $20K (fee paid). Contact Bill Grady (in confidence).

ROBERT HALF
PERSONNEL AGENCIES
140 Faderal St.
Boston, Mass. 02110
(617) 423-6440

APPLICATIONS PROGRAMMER

Tha Purdue Univarsity Administrative Oeta Processing Center has openings for axperianced applications programmers. The computer facility is an IBM 370/145 with OS/VS1, C.I.C.S., and ROSCOE.

Desired Qualifications:
- Business applications programming experience
- ANS COBOL
- College dagree
- OS/VS JCL

Excellent fringe benefit program in the environment of a large university.

Please submit resume with raferences, salary history, and work experience to: Mr. T.L. Haworth, Personnel Services - AOMS, Purdue University, West Lafayette, IN 47907, (317) 749-6256

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PROGRAMMER/ANALYSTS

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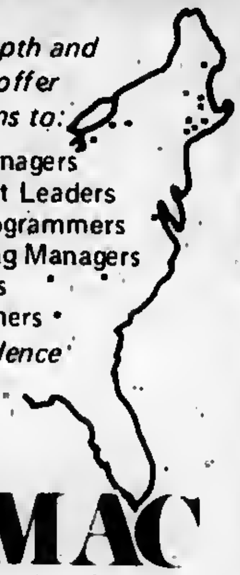

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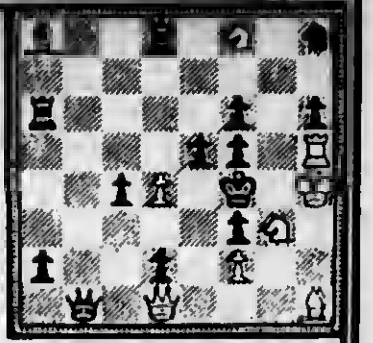

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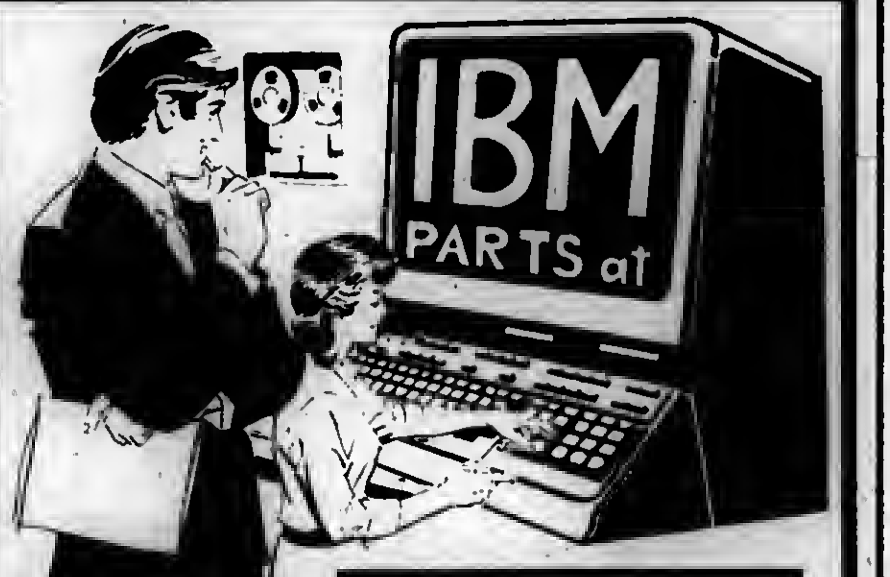

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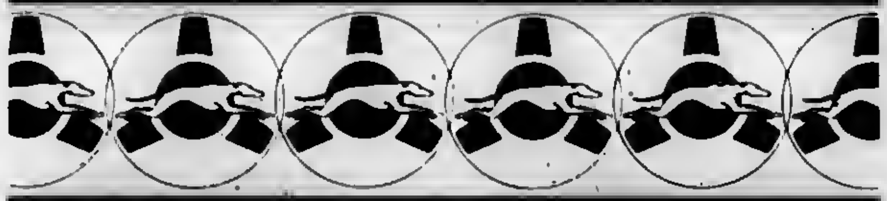

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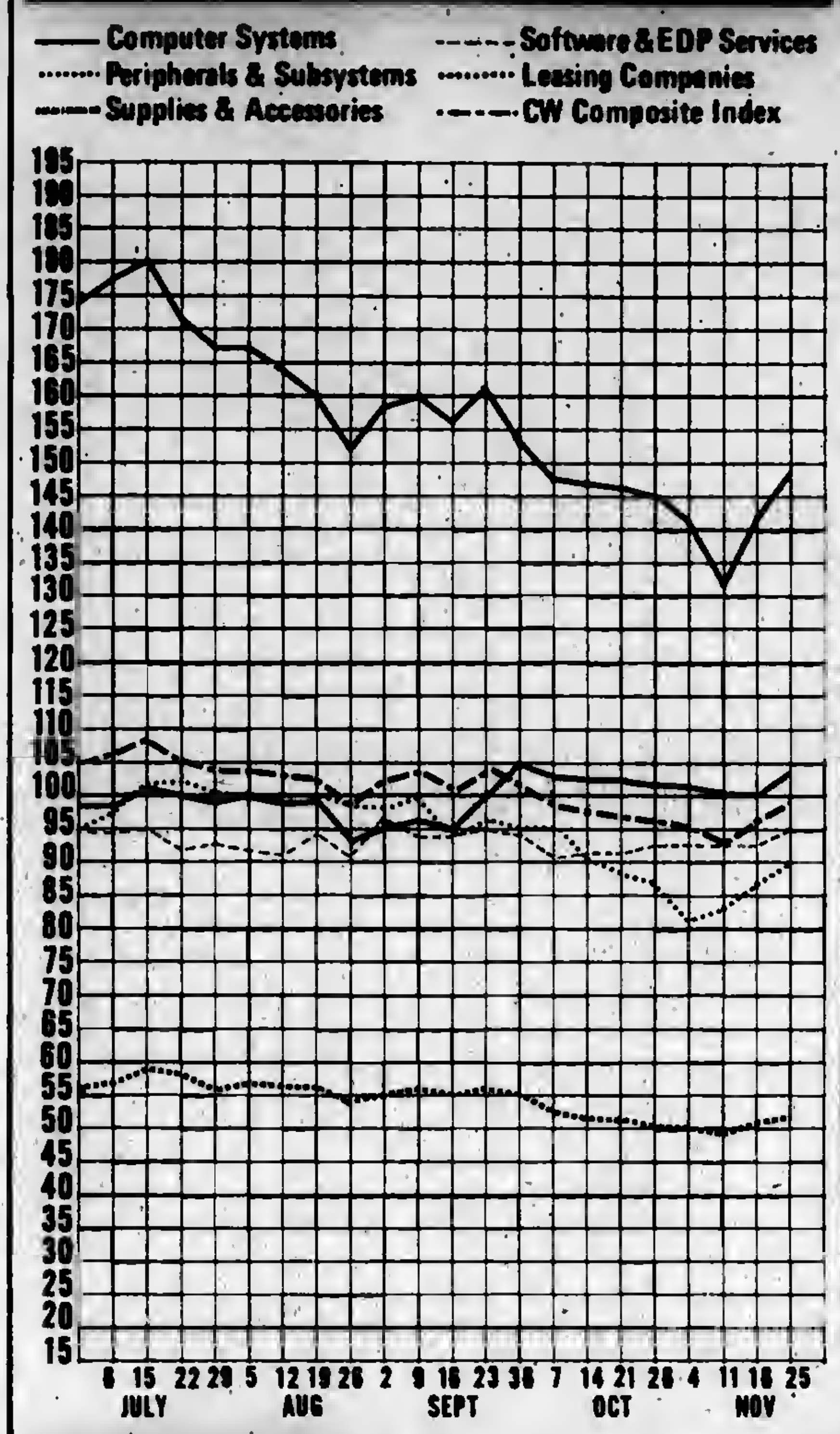

Earnings Reports

DPF
Three Months Ended Aug. 31

	1976	1975
Shr Ernd	$.30	$.03
Revenue	6,636,000	5,669,000
Tax Cred	138,000	28,000
Earnings	1,285,000	116,000

ELECTRONIC ARRAYS
Three Months Ended Sept. 30

	1976	1975
Shr Ernd	.....	$.10
Revenue	$3,551,000	3,817,000
Tax Cred	a(25,000)	74,000
Earnings	(1,487,000)	175,000
6 Mo Shr	.....	.13
Revenue	8,600,000	7,534,000
Tax Cred	.....	81,000
Earnings	(1,342,000)	236,000

a-Reversal of tax-loss carryforward.

ELECTRONIC ASSOCIATES
Three Months Ended Oct. 1

	1976	a1975
Shr Ernd	.....	$.64
Revenue	$6,154,000	7,604,000
Disc Op	.....	664,000
Tax Cred	12,000	818,000
Earnings	(780,000)	1,707,000
9 Mo Shr	.....	.89
Revenue	17,905,000	22,854,000
Disc Op	544,000	684,000
Tax Cred	276,000	1,119,000
Earnings	(1,132,000)	2,368,000

a-Restated.

COMPUTER SCIENCES
Three Months Ended Oct. 1

	1976	1975
Shr Ernd	$.26	$.12
Revenue	57,943,000	53,546,000
Tax Cred	750,000	.....
Earnings	3,668,000	1,723,000
6 Mo Shr	.49	.23
Revenue	113,484,000	103,913,000
Tax Cred	1,500,000	.....
Earnings	6,956,000	3,247,000

COMPUTER PRODUCTS
Three Months Ended Sept. 24

	1976	1975
aShr Ernd	$.08	$.04
Revenue	1,522,430	1,025,242
Earnings	118,200	57,564
a9 Mo Shr	.25	.15
Revenue	4,316,723	3,113,352
Earnings	361,474	201,609

a-Reflects Nov. 1, 1976 20% stock dividend.

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Computerworld Stock Trading Summary

CLOSING PRICES TUESDAY, NOVEMBER 23, 1976

All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		PRICE 1976 RANGE (1)	CLOSE NOV 23 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	AMDAHL CORP	23- 30	27 5/8	- 1/4	-0.8
N	BURROUGHS CORP	84-108	91 1/4	+1 3/8	+1.5
O	COMPUTER AUTOMATION	10- 19	16 3/4	+2 5/8	+18.5
N	CONTROL DATA CORP	18- 27	23 1/8	+1 1/8	+5.1
N	DATA GENERAL CORP	40- 60	46 3/4	+1 3/4	+3.8
O	DATAPOINT CORP	24- 46	28 1/2	+ 1/4	+0.8
O	DIGITAL COMP CONTROL	2- 7	5 3/4	+ 3/8	+6.9
N	DIGITAL EQUIPMENT	46- 60	53 5/8	+1 3/8	+2.6
N	ELECTRONIC ASSOC.	2- 5	2	- 1/8	-5.8
A	ELECTRONIC ENGINEER.	7- 16	8 3/4	+ 3/4	+9.3
O	FOUR-PHASE SYSTEMS	13- 21	15 1/4	+ 7/8	+6.0
N	FOXBORO	28- 50	49	+4 1/2	+10.1
O	GENERAL AUTOMATION	4- 11	4 1/2	+ 1/4	+5.8
O	GRI COMPUTER CORP	1- 1	1/2	- 1/8	-20.0
N	HEWLETT-PACKARD CO	80-117	89	+5 5/8	+6.7
M	HONEYWELL INC	34- 56	44	+ 1/2	+1.1
N	IBM	227-288	269 3/8	+1 7/8	+0.7
O	MANAGEMENT ASSIST	1- 7	7 3/8	+1 5/8	+28.2
O	MEMOREX	17- 33	20 3/4	+2 1/2	+13.6
O	MICRODATA CORP	10- 28	15 7/8	+1 3/4	+12.3
O	MODULAR COMPUTER SYS	3- 14	4 3/4	+1	+26.6
N	NCR	24- 37	33 7/8	+ 5/8	+1.8
O	PRIME COMPUTER INC	4- 15	14 1/2	+ 1/2	+3.5
N	PERKIN-ELMER	19- 27	20 7/8	+1 5/8	+8.4
M	RAYTHEON CO	45- 67	61 3/4	+1 3/4	+2.9
M	SPERRY RAND	40- 52	44 1/2	+ 1/8	+0.2
O	SYCOR INC	9- 31	12	- 1/2	-4.0
A	SYSTEMS ENG. LABS	5- 10	6 1/8	0	0.0
N	VARIAN ASSOCIATES	12- 17	13 1/2	+ 1/4	+1.8
A	WANG LABS.	11- 20	14 7/8	+1 1/4	+9.1

LEASING COMPANIES

EXCH		PRICE 1976 RANGE (1)	CLOSE NOV 23 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	BOOTHE COMPUTER CORP	1- 8	6 7/8	+ 3/8	+5.7
O	CONDISCO INC	3- 10	9 1/2	0	0.0
A	COMMERCE GROUP CORP	2- 3	1 3/4	0	0.0
A	COMPUTER INVSTRS GRP	1- 3	1 3/8	0	0.0
M	DATRONIC RENTAL	1- 8	1 1/4	+ 3/8	+42.8
A	DCL INC	1- 1	5/8	0	0.0
N	DPF INC	5- 8	6 5/8	- 1/4	-3.6
N	ITEL	6- 15	12 3/4	+ 1/4	+2.0
N	LEASCO CORP	6- 19	18 1/8	+ 1/8	+0.6
O	LEASPAC CORP	0- 1	1/8	0	0.0
O	MRG INC	0- 1	1/8	0	0.0
A	PIONEER TEX CORP	6- 9	7 1/2	+ 1/4	+3.4
N	U.S. LEASING	7- 12	8 7/8	+ 1/4	+2.8

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
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SOFTWARE & EDP SERVICES

EXCH		PRICE 1976 RANGE (1)	CLOSE NOV 23 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 3	1 1/8	+ 1/8	+12.5
O	ANACOMP INC	6- 11	6 3/4	0	0.0
A	APPLIED DATA RES.	2- 4	3 7/8	+ 1/4	+6.8
N	AUTOMATIC DATA PROC	17- 35	29 1/2	+2	+7.2
O	COLEMAN AMERICAN COS	2- 6	2 3/8	0	0.0
O	COMPU-SERV NETWORK	3- 10	8	0	0.0
O	COMPUTER DIMENSIONS	3- 7	6 1/4	+ 1/2	+8.6
O	COMP ELECTION SYSTMS	5- 9	5	- 1/4	-4.7
O	COMPUTER HORIZONS	1- 2	1 3/4	+ 1/4	+16.6
O	COMPUTER NETWORK	2- 7	7 1/4	+1 1/2	+26.0
N	COMPUTER SCIENCES	4- 8	6 1/8	+ 1/2	+8.8
O	COMPUTER TASK GROUP	1- 2	1 1/4	0	0.0
O	COMPUTER USAGE	3- 6	2 5/8	- 1/8	-4.5
O	COMSHARE	2- 9	6	+ 1/2	+9.0
O	DATA DIMENSIONS INC	2- 4	3	0	0.0
O	DATATAB	1- 2	1 1/2	0	0.0
N	ELECTRONIC DATA SYS.	12- 18	15 3/8	- 1/2	-3.1
O	INFOMATIONAL INC	1- 1	1/8	0	0.0
O	INSYTE CORP	1- 3	1 1/2	0	0.0
O	IRS COMPUTER MARKET.	1- 2	1 1/8	0	0.0
O	KEANE ASSOCIATES	2- 4	2 3/4	+ 3/8	+15.7
O	KEYDATA CORP	1- 5	1 3/4	+ 1/4	+16.6
O	LOGICON	3- 5	5 3/8	+ 3/8	+7.5
A	MANAGEMENT DATA	1- 3	2	0	0.0
A	NATIONAL CSS INC	13- 25	19 5/8	+1 5/8	+9.0
O	NATIONAL DATA CORP	4- 7	4 7/8	- 1/8	-2.5
A	ON LINE SYSTEMS INC	17- 22	20 1/4	+1 5/8	+8.7
N	PLANNING RESEARCH	3- 5	3 1/2	- 1/8	-3.4
O	PROGRAMMING & SYS	1- 1	1/4	- 1/8	-33.3
O	RAPIDATA INC	2- 5	1 3/4	+ 1/8	+7.6
O	REYNOLDS & REYNOLD	13- 21	15 3/4	+ 1/2	+3.2
O	SCIENTIFIC COMPUTERS	1- 1	7/8	0	0.0
O	TYMSHARE INC	14- 28	16 1/2	0	0.0
A	URS SYSTEMS	3- 5	3 1/2	0	0.0
N	WYLY CORP	1- 7	1 1/6	- 1/8	-10.0

PERIPHERALS & SUBSYSTEMS

EXCH		PRICE 1976 RANGE (1)	CLOSE NOV 23 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	8- 13	10 1/8	- 7/8	-7.9
O	ADVANCED MEMORY SYS	4- 10	6	- 1/4	-4.0
N	AMPEX CORP	5- 10	6 3/8	+ 1/8	+2.0
O	ANDERSON JACOBSON	2- 4	2 7/8	- 1/8	-4.1
O	APPLIED DIG DATA SYS	13- 25	16	0	0.0
O	BEEHIVE MEDICAL ELEC	3- 9	8 1/2	+ 1/8	+1.4
A	BOLT,BERANEK & NEW	7- 11	7 7/8	0	0.0
N	BUNKER-RAMO	5- 10	7	- 1/8	-1.7
A	CALCOMP	4- 7	4 5/8	- 1/8	-2.6
O	CAMBRIDGE MEMORIES	0- 6	1/2	0	0.0
N	CENTRONICS DATA COMP	20- 36	23 1/8	-1 3/4	-7.0
O	CODEX CORP	22- 42	29 1/2	+1	+3.5
O	COGNITRONICS	1- 1	1/2	0	0.0
O	COMPUTER COMMUN.	1- 6	4 3/4	- 1/8	-2.5
O	COMPUTER CONSOLES	4- 7	4 3/4	+ 1/2	+11.7
A	COMPUTER EQUIPMENT	1- 3	1 7/8	0	0.0
O	COMPUTER TRANSCEIVER	1- 3	7/8	0	0.0
O	CONTEN	4- 9	8	+ 7/8	+12.2
N	CONRAC CORP	20- 25	21 7/8	+ 3/8	+1.7
O	DATA ACCESS SYSTEMS	1- 5	5	+ 1/4	+5.2
O	DATA 100	6- 13	6 3/4	+ 1/8	+1.8
A	DATA PRODUCTS CORP	5- 15	11 1/8	+ 1/8	+1.1
O	DATA TECHNOLOGY	1- 2	1 7/8	+ 3/8	+25.0
O	DATUM INC	1- 2	3/4	+ 1/8	+20.0
O	DECISION DATA COMPUT	1- 4	1 1/2	0	0.0
O	DELTA DATA SYSTEMS	1- 1	1/2	0	0.0
N	ELECTRONIC M & M	1- 4	2 7/8	+ 1/4	+9.5
O	FABRI-TEK	1- 1	7/8	0	0.0
O	GENERAL COMPUTER SYS	0- 2	3/8	- 1/8	-25.0
N	HAZELTINE CORP	4- 12	8 3/4	+ 1/8	+1.4
N	HARRIS CORP	34- 55	53 7/8	+3 1/2	+6.9
A	INCOTERM CORP	9- 20	11 5/8	+ 1/4	+2.1
O	INFOREX INC	3- 7	4 1/2	+ 5/8	+16.1
O	INFORMATION INTL INC	10- 18	12 1/8	+ 1/8	+1.0
O	INTEL CORP	47-109	53 1/2	+5	+10.3
A	LUNDY ELECTRONICS	3- 7	3 7/8	+ 1/2	+14.8
O	MSI DATA CORP	3- 7	6 1/8	- 1/8	-2.0
A	MILGO ELECTRONICS	15- 22	20 1/2	- 1/8	-0.6
N	MOHAWK DATA SCI	3- 10	5 7/8	+ 3/8	+6.8
O	PENRIL CORP	1- 3	1 3/4	- 1/8	-6.6
A	PERTEC CORP	3- 8	6 5/8	+ 7/8	+15.2
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	2- 10	2	0	0.0
O	QUANTOR CORP	4- 6	4 1/2	- 1/8	-2.7
O	RECOGNITION EQUIP	6- 11	9	+ 5/8	+7.4
N	SANDERS ASSOCIATES	6- 11	8 1/2	+ 1/2	+6.2
O	SCAN DATA	1- 4	1 1/4	0	0.0
O	STORAGE TECHNOLOGY	9- 13	10 1/2	- 1/8	-1.1
O	T BAR INC	5- 10	6 1/4	+ 3/4	+13.6
O	TALLY CORP.	4- 6	5 1/2	+ 1/8	+2.3
O	TEC INC	3- 7	6 1/2	0	0.0
N	TEKTRONIX INC	45- 69	62 3/8	+2 3/8	+3.9
N	TELEX	2- 5	2 1/4	0	0.0
O	WANGCO INC	11- 22	21 1/8	0	0.0
O	WILTEK INC	2- 2	1 1/2	+ 1/8	+9.0

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O	ADVANCED SYSTEMS INC	1- 4	3 3/8	0	0.0
O	BALTIMORE BUS FORMS	3- 5	3 5/8	0	0.0
A	BARRY WRIGHT	6- 10	9	+ 3/8	+4.3
O	CYBERMATICS INC	0- 1	3/8	+	+16.7
A	DATA DOCUMENTS	25- 45	45 1/4	0	0.0
O	DUPLEX PRODUCTS INC	13- 24	12 3/4	0	0.0
N	ENNIS BUS. FORMS	6- 8	5 3/4	+ 1/8	+2.2
O	GRAHAM MAGNETICS	8- 13	10 1/2	+ 1/4	+2.4
O	GRAPHIC CONTROLS	13- 19	16 1/4	0	0.0
N	3M COMPANY	53- 66	58 1/2	+2	+3.5
O	MOORE CORP LTD	32- 51	33 3/4	+ 1/2	+1.5
N	NASHUA CORP	11- 18	17 3/8	+1 5/8	+10.3
O	STANDARD REGISTER	15- 19	17 1/2	+ 1/4	+1.4
O	TAB PRODUCTS CO	5- 11	9	+ 1/4	+2.8
N	UARCO	19- 25	19 1/2	+ 1/8	+0.6
A	WABASH MAGNETICS	4- 10	10 1/4	+1	+10.8
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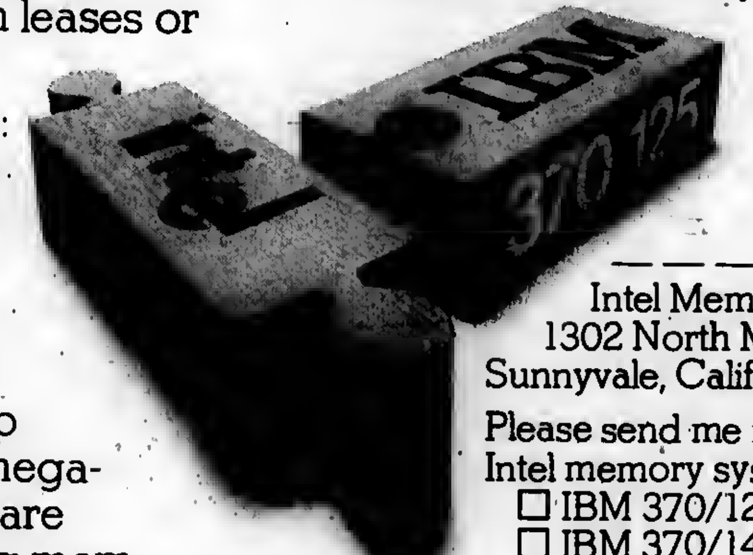

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CW Photo by R. Frank

John G. Kemeny (right), Dartmouth College president, alumnus Peter Kiewit (center) and Thomas E. Kurtz (left), director of academic computing, officiate at unveiling of plaque marking 10th anniversary of the Kiewit Computation Center. The ceremony was part of a symposium on "Man and the Computer" held last week. Coverage continues on pages 4 and 5.

DP Charged With Warping American Political System

By E. Drake Lundell Jr.
Of the CW Staff

HANOVER, N.H. – Computers have warped the founding fathers' idea of checks and balances in the American political system, according to Dr. Frank Ryan, director of information systems for the U.S. House of Representatives.

There is a need to reexamine whether those checks and balances can still be effective in the computer age, Ryan told last week's symposium on "Man and the Computer" sponsored by Dartmouth College's Kiewit Computation Center here.

Computing and politics interact in a number of ways, Ryan explained, with computer applications affected by political decisions in many areas and the political process itself affected by computer use.

Computing and politics are similar in that both are pervasive in all areas of life, but not really well understood by the public or, in many cases, by the practitioners in either field, he said.

On the issue of political influence on computer development and applications, Ryan noted this causes the policymakers great problems since computing is not always well enough understood by the policymakers to allow them to make the necessary decisions.

But the other side of the issue is perhaps more important, he indicated.

While politics is essentially a process of compromise between competing ideas and policy choices, the use of computing in that process suggests a discipline and a science, he said.

That claim for computing is unwarranted in the political sphere, because of the human nature of the political process, he noted.

Convincing vs. Informing

Using computers for such things as public opinion analysis and selected mailings during an election campaign enhances a candidate's ability to convince the electorate while not necessarily informing it, Ryan pointed out. The distinction between convincing and informing is subtle, he admitted, but contended it is a crucial distinction.

Computers allow campaigners to tailor their mailings to selected interest groups, he noted, which emphasizes the importance of those groups, perhaps to the detriment of the general populace.

In addition, bringing computers into an election campaign – along with other sophisticated modern technology – has boosted the cost of campaigns so much that some people or elements in society can no longer afford to take an active part in the political process, he stated.

In another example, Ryan said the installation of an automated vote-counting system in the House of Representatives had also introduced some bias into the system.

The members of the House often played games with the tallying by either voting or changing their votes at the last second depending on how the tabulations were going. This resulted in chaos, he said, until the House rules were changed to eliminate the practice.

While the automated voting system has speeded up each individual vote, the House actually spends more time voting now because the system is easier to use than the older manual method and the House is taking formal votes on more issues than it would have before.

(Continued on Page 4)

Drug-Tracking System Stopped; Court Rules It Violates Privacy

By John P. Hebert
Of the CW Staff

NEW YORK – Computerized systems that keep track of prescribers, dispensers and recipients of habit-forming drugs violate individual privacy rights guaranteed by the 14th Amendment to the U.S. Constitution.

Based on that decision, a federal district court here has forced this state to stop gathering information on recipients of Schedule II narcotics such as opium derivatives.

The state appealed the case to the U.S. Supreme Court whose decision is still pending although it heard the case more than six weeks ago.

While the case involves the privacy – and near-sanctity – of the doctor-patient relationship, a much broader question is at stake, observers said. That question is: Is confidential information stored in a computerized system more susceptible to disclosure than information stored in a manual system?

Computer scientists have argued the computer is "neutral." Many privacy advocates have provided evidence that it is not.

A law passed in 1972 approved the use of triplicate forms identifying the prescriber, dispenser and recipient of the Schedule II narcotics in the state's computerized tracking system.

Without the patients' names, the state has no way of knowing whether physicians, dentists and veterinarians are il-

(Continued on Page 4)

U.S. vs. IBM Presses Onward With Fumbling Foray to Florida

By Catherine Arnst
Of the CW Staff

MIAMI – Florida is not only "where the boys are"; it's also where U.S. vs. IBM was last week as the antitrust trial journeyed south in one of the more bizarre occurrences in the 18-month-old trial.

Ernest Hughes, a retired IBM engineer who was instrumental in developing IBM's first computers, was on the stand. Hughes' healthy Florida tan belied any signs of illness an illness IBM said would make him unable to travel to New York next year to testify in IBM's behalf.

Answering in a soft southern drawl, Hughes described his part in the development of several different computer systems.

The case's latest setting was a far cry from the austere decor of Room 110 in the federal courthouse in New York, the trial's permanent residence.

Miami's federal courthouse shares its roof with the U.S. Post Office. The bright blue rug in the courtroom was balanced by Greek columns and the building's grey exterior – an unusual design when viewed in the midst of the city's more typical Spanish-style architecture – all bathed in bright sunshine.

But the whole situation turned sour

(Continued on Page 7)

FCC Opens Door to Interstate Dataspeed Tariff

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – The Federal Communications Commission (FCC) has opened the door for AT&T to tariff its Dataspeed 40/4 CRT terminal for interstate users.

In a notice issued late last month, the FCC called Dataspeed 40/4 service "not inconsistent with its existing computer rules" and announced its intention to "reverse" a previous decision by the chief of the Common Carrier Bureau on the matter.

That ruling found the Dataspeed 40/4 primarily a DP device which therefore could not be tariffed by AT&T for interstate use under existing commission rules.

Intrastate tariffs already have been approved for the terminal in various states.

The full text of the commission's order will be released in two or three weeks, the FCC said.

The action by the commission tied any final decision on the AT&T CRT terminal to the recently reopened Computer Inquiry which will examine the boundary between data communications and DP offerings [CW, Aug. 9].

Under existing regulations, a common carrier is prohibited from offering an interstate service which is primarily DP in nature with incidental data communications aspects. Walter Hinchman, the Common Carrier Bureau chief, had ruled certain features of the Dataspeed 40/4, such as its binary synchronous communications, buffering and clustering capabilities, were specifically designed to meet the needs of DP users.

AT&T objected to this interpretation and took the position that the Dataspeed 40/4 was merely an extension of capabilities offered for many years in teletypewriter service tariffs.

The FCC notice overturning Hinchman's decision said the "determination was made contingent on the outcome of the pending Computer Inquiry rulemaking, Docket 20828. It is intended that this docket will be subsequently enlarged to specifically address the issues raised by the Dataspeed 40/4 filings."

AT&T expects to file a tariff very soon based on the FCC's notice, a spokesman said. But a commission spokesman pointed out that the notice issued was simply a press release and any action taken before the text of the decision is available would be premature.

Although no vote will be taken until the full text of the decision is drafted by the Common Carrier Bureau, an FCC source said a majority of the commissioners are known to favor overturning the common carrier chief's earlier ruling.

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With One Case Reported

Mini Ready to Track Swine Flu Outbreak

By Ann Dooley
Of the CW Staff

ATLANTA – With only one case of swine flu reported to date, officials are divided on the potential hazard posed by the disease this winter.

Either way, the Department of Health, Education and Welfare's National Center for Disease Control (NCDC) here is using a minicomputer to track any outbreaks that might occur, according to Gordon Storr, a computer graphics programmer at the center.

But the flu surveillance system was not meant to help stop an epidemic once it has begun to spread. Once the surveillance team spots an epidemic, it will be too late to take any action such as increasing vaccine supplies because the population in striken areas probably would have already been exposed to the disease, Storr explained.

The system was designed, however, to help local health officials predict when and how severe an epidemic might be in their locales.

Statistics Solicited

About a year ago, for purposes of comparison, the center began soliciting statistics on what are considered "normal" rates of illness – or morbidity – from hospitals, laboratories, schools, state agencies and key physicians in the 50 states as well as in the World Health Organization, according to Storr.

Morbidity is represented by such factors as the incidence of absenteeism from work or school, the number of medical visits for influenza-type illnesses and the number of pneumonia deaths per week, for example.

Information is collected weekly from each of the contributing sources and stored in the minicomputer data bank. An updated surveillance report is compiled weekly and sent to health agencies and any other medical officials interested in the current status of influenza across the country.

The data base now contains morbidity information from 284 industries, 727 schools, 380 hospitals and clinics, 203 sentinel physicians, 1,408 counties and 121 cities, Storr said.

Geographic Plotting

Once this information is compiled and analyzed, the center uses a California Computer Products, Inc. 936 drum plotter to produce a map of the country that reveals any increase or decrease of viral disease compared with the norm.

Although one school or business may not realize its absentee rate is high enough to constitute an outbreak, the center can use the map to pick out overall patterns and abnormalities, Storr noted.

Using the data stored in the computer, the NCDC can trace an epidemic over a period of time as well as over an area, he added.

Besides the Digital Equipment Corp. PDP-11/40 minicomputer and the drum plotter, NCDC's system is composed of two video screens used for data input, a 130 char./sec Decwriter with four disk drives, one tape drive and a graphics terminal screen.

The national influenza surveillance team at the NCDC consists of seven doctors, two computer programmers and several office personnel, Storr said.

While surveillance operations such as this have been in effect for rabies control and some other diseases for many years, this is the first such nationwide program, he explained.

The center also was involved in the investigation of the American Legion Disease [CW, Aug. 16] when it was thought the deaths might be caused by the swine flu.

N.Y. Decides to Collect Taxes On Software, Services Since '65

By Molly Upton
Of the CW Staff

ALBANY – New York State plans to collect taxes from software vendors and DP service firms for any period since 1965, according to Paul Greenberg, secretary to the New York State Tax Commission.

Although some people would consider this a "retroactive" tax, the state does not view it that way, according to Greenberg, because the law under which the state now is declaring software taxable has been in effect since 1965.

The law was recodified late last summer [CW, Nov. 1], but is "in no sense a new law," he said.

The nature of the tax collection effort boils down to a difference in semantics. Greenberg explained there is a difference between collecting a tax owed in the past and levying a tax retroactively.

Asked why taxes were never collected if the law was in effect since 1965, Greenberg answered, "The burden of being aware of the responsibility to pay taxes rests on the taxpayer."

There is no particular program to single out any specific industry such as software, he added. Although several software firms' books have been audited by the state, that is part of the state's "normal auditing process," he said, "not a drive to uncover collectibles from any particular segment."

David Campbell, head of the New York State tax group of the Association of Data Processing Service Organizations (Adapso), said the group will request state tax authorities to define those areas considered taxable, such as contract programming.

Obtaining such definitions would be the first step in seeking new court rulings on taxation of certain DP areas, he indicated.

Currently the codification of statutes gives examples of time-sharing and contract programming, but not specific definitions, Campbell explained.

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*Volume Ten, Number Three, 1971.

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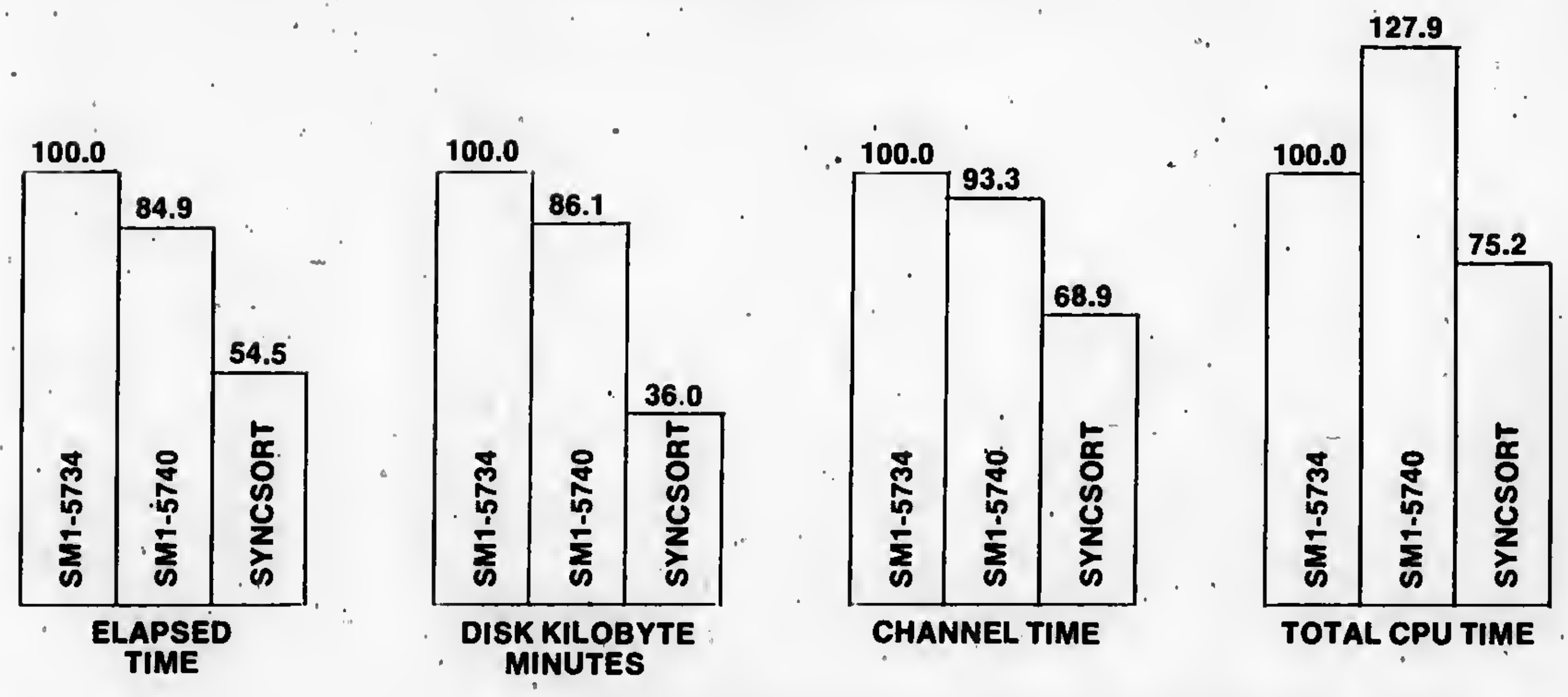

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Risks Associated With DP Should Be Studied: Davis

By Ronald A. Frank
Of the CW Staff

HANOVER, N.H. – The fact that computer privacy and security have become public issues is just the first indication that the risks associated with computer systems have not been adequately considered, according to Dr. Ruth M. Davis, director of the Institute for Computer Sciences and Technology at the National Bureau of Standards.

DPers "do not know how to tell when a computer system is not performing its intended functions or when a computer system is performing a function which was not intended," Davis said.

Until computer professionals provide scientific and technological facts about the dangers, safety, risk and cost of computer systems, these issues will be dealt with on the basis of emotion, prejudice and other nonfactual data, Davis warned at the Dartmouth College symposium on "Man and the Computer" here last week.

Looking at the risks associated with computers is a beneficial way of discussing the problems of computers, Davis said. This can be done by comparing the relative utility of computers with other alternatives and evaluating the risks associated with each approach.

Once the risks have been identified, it is possible to associate them with the cost of applying safeguards. But attempting to manage risk and determine safety is not a familiar concept to computer professionals, she said.

Areas of computer applications that appear to be in the high-risk category are large funds disbursement systems; large individual Information systems such as credit reporting, law enforcement, educational records and medical records; and large public safety control systems such as air traffic control and nuclear power plant control, she explained.

CW at Dartmouth

Davis cited several "fictionalized" examples of specific types of risks which might be Identified. The cost of health care could increase by 10% if data on ineligible claimants were to be included in a system; there mlght be a 25% probability that "an improperly motivated individual" could obtain enough plutonium within a year to build a bomb; and there could be a 30% probability that an individual with three credit cards would have an error in a credit record, she suggested.

Stressing these were "risk fiction scenarios," Davis said once the risks have been identified, it would become possible to assess the costs to the consumer and manager of the system and the costs of reducing the risks to an acceptable level.

But no responsible set of criteria for reducing risks which takes into account both the consequences and costs now exists in the private sector, she noted. Such risk identification would have to be tied to a widespread consensus on priorities for reducing risks, she said.

DP Warping Checks and Balances

(Continued from Page 1)

Computers are blurring the distinction between the branches of government envisioned by the founding fathers, Ryan said, because they are making the legislative branch dependent on the executive branch for information.

As an example, Ryan said a Joint House-Senate Committee on Taxation recently had to rely on a computer model developed and run by people in the executive branch to determine the possible effects of changes in the tax law.

Congress is far behind the executive branch in developing computerized tools to aid in the decision-making process, he said.

Because of the effects of computers in the political arena, a better understanding of the environment in which computers are placed – particularly the political environment – is necessary, he added.

If the unplanned consequences of computers in the political process are going to be eliminated, a new environmental model of the political system is needed – a new *Federalist Papers*, he said.

Court Forces N.Y. to Stop Drug-Tracking System

(Continued from Page 1)

legally prescribing or overprescribing the narcotics or unwittingly prescribing the drugs to drug addicts who go from doctor to doctor to support their habit, according to John Bellizzi, director of the Bureau of Narcotics Enforcement of the New York State Department of Health.

Under the October 1975 decision of the U.S. District Court for the Southern District of New York in Roe vs. Ingraham (now Roe vs. Whalen), the state was forced to halt use of the patient identifier on the federally numbered triplicate forms.

But the three-judge panel went one step further in rejecting the state's argument it was doing no more information gathering with the computerized system.

"The intrusion here is not only more immediate, its impact is greater," the court said.

"A name on a prescription form in the files of one of many thousands of pharmacists in the State of New York is entirely different from one's name on a form in Albany which is transferred to computerized records and stored for instant retrieval."

The court held that centralized computer systems pose a far greater potential for broadcasting damaging information than the scattered manual systems previously employed.

As such, the state's health law requiring pharmacists to give state drug authorities the names and addresses of patients receiving such drugs is "an unconstitutional interference with plaintiffs' rights of privacy guaranteed under the 14th Amendment."

New York's computerized system is used because of what was thought to be a problem of fairly widespread drug abuse by both patients and prescribing doctors.

Batch Operation

The forms are sold to the 70,000 individuals authorized to prescribe or dispense the opium derivatives, according to Irv Ovedovitz, DP supervisor for the State Department of Health's Computer Unit.

The unit keypunches the information found on one copy of the form and processes it on a Burroughs B6700 mainframe for storage on tape, Ovedovitz said.

"It's strictly a batch operation. There is very tight security on control substances systems," he said.

The system helps to spot such things as exceptions to the norm or unusual patterns of overdispensing that lead to further investigations, he explained.

But New York has been left with a system that has little advantage over the manual system it had for 50 years before computerization, according to Bellizzi. The state looks toward the patient to make a case against the practitioner, he noted.

No more cases have been made against the health practitioners than with the previous manual system because of a three-month lag in getting printouts from the system and the state's inability to use a patient identifier, he said.

An estimated 1% to 2% of the nation's doctors are engaged in the illegal sale of controlled drugs; greater percentages of doctors are overprescribing the narcotics, barbituates and amphetamines, according to James F. Hogan, the Federal Drug Enforcement Administration (FDEA)'s liaison with the states.

Three other states presently use the federal triplicate-form drug-tracking system – Illinois, California and Idaho – and Ohio is considering using the system pending the outcome of the New York case, Hogan said.

The system, Hogan noted, serves a dual purpose: it eliminates the illegal prescription of the controlled substances and makes doctors and pharmacists more aware of careless overprescription once they know they are being scrutinized.

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Despite Improvement of Systems

Ideal Division Between Man, System Still Unknown

By Ronald A. Frank

Of the CW Staff

HANOVER, N.H. – Although there have been significant improvements in the systems shared by man and computer, the ideal division of labor between the two is still unknown.

And as computer science develops, less and less advantage of the talents of human beings is being taken, according to John G. Kemeny, president of Dartmouth College.

Delivering the keynote address at a symposium on "Man and the Computer" celebrating the 10th anniversary of the Klewit Computation Center here, Kemeny said man's expectationa of perfection from computer systems are deterring the spread of computer power to a wider cross-section of the population.

The interface between man and the computer must be simplified ao humans will not approach machines with apprehension, especially if they are not familiar with the technology, he said.

A higher level language is needed that can be modified to meet the requirements of the user. And while there is no known algorithm that can figure out user mistakes, it may be possible to have a language that will "grow" as the user's definitions of terms are modified, Kemeny speculated.

Higher level languagea today are either too general – like Algol – and thus get little use or they are too specific. What is needed is a software package that will redefine instructions in a language like Basic "for the user's own purposes," he said.

One of the greatest disappointments of the past 10 years has been the lack of a lower cost general-purpose terminal. In fact, terminals have become more expensive in that time period, Kemeny said.

Not foreseen in 1966 were the incredible advances made in the cost and size of memory and logic. But these can only become significant if waya can be developed to manage, update and retrieve information efficiently from large data bases, he said.

The time-sharing pioneer said the emergence of the minicomputer has delayed development of national computer time-sharing networks. Minis can cut off the user from the benefits of aharing common techniques and data bases and, in this respect, the minicomputer has been "a step in the wrong direction," he said.

Kemeny said it has been a great disappointment that so few colleges have developed the computer as a tool for learning. "If you can't achieve widespread use of the computer for college graduates, how can you expect it for the general public?" he asked.

As for a national automated reference library, Kemeny said "regrettably, we are no closer to having one today than when that resource was first called for in 1961."

Looking toward the next 10 years, Kemeny predicted lower cost terminals will be developed along with voice I/O techniques.

Bringing the computer terminal into the home will have widespread implications for the energy problems of society, he said. The ratio of time spent traveling to work compared with useful work time will be reduced as more work is done through terminals from the home, he added.

The year 1990 looks like a realistic target when widespread home terminals will be able to access multiple national time-sharing networks, he predicted.

These national networks, however, must not become a monopoly of one single company, he warned.

CW at Dartmouth

FCC Prepares Way For Dataspeed Tariff

(Continued from Page 1)

Comments on the second Computer Inquiry are due on Jan. 10; several parties who had planned to file comments to the proposed rules indicated they would now have to add comments regarding the Dataspeed 40/4.

The exact impact of the FCC action is unclear to regulatory experts.

One expert commented that the FCC appeared to be involving the Dataspeed problem with the Computer Inquiry since it was a key example of the difficulty of differentiating between DP and data communications.

The wording of the FCC notice appeared to make it possible the Dataspeed 40/4 might again be rejected if the capabilities of the device were in conflict with final rules to be adopted under the inquiry.

But one Washington source said approval of an interstate tariff for the AT&T terminal would make it unlikely the device would later be "detariffed." If users had the terminal operating on interstate data communications networks, it is doubtful the FCC would rescind such an authorization, he said.

Independent CRT terminal suppliers, including IBM, have objected to the initial AT&T tariff filing. They contend it is unfair to permit a common carrier to offer a device which competes directly with nonregulated terminals supplied by DP equipment manufacturing companies.

An IBM spokesman said, "We are aware of the FCC'a decision reversing the earlier decision, but we prefer to withhold comment pending more detailed information."

A spokesman for Sanders Associates, an independent CRT supplier, said "there can be no question that the Dataspeed synchronous model is a DP device and that its offering violates the spirit, if not the letter, of the 1956 Justice Department consent decree [with AT&T] and the FCC's hybrid service rules of the original Computer Inquiry."

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Now Being Used at Research Sites

Terminal-Based Message Systems Seen Feasible

By Ronald A. Frank
Of the CW Staff

GAITHERSBURG, Md. – Terminal-based electronic message systems are operational in several research environments and will become commercially feasible within the next few years, according to Albert Vezza of MIT's Laboratory for Computer Science.

Speaking at a recent symposium on computer networks held at the National Bureau of Standards here, Vezza said electronic message systems use data base management principles and can be integrated with management information systems.

A message system allows a user to exchange, edit, create and send information to others connected to the system. In most existing systems of this type "a concerted effort has been made to provide a user interface that is understandable to those unsophisticated in computer lore," he said.

The message systems are more than "simple creation and delivery" operations because the addition of CPU control and data base methods make them a first step toward "office automation systems," Vezza said.

There are currently about 100 private and governmental organizations operating on the packet-switched Arpa network, Vezza said, and many of these have developed in-house message systems. Some host CPUs on the network now handle several separate electronic message systems.

"Writer-to-reader electronic message services transcend the boundary between the office environment and the delivery or postal system. Not only are messages delivered electronically, but a computational service can be provided that automates the secretary's and file clerk's functions," he noted.

But despite their promise, serious problems still remain to be resolved with these systems, Vezza said. As long as users operate within one discrete in-house system, there is no problem.

When interorganization message systems begin to operate, however, a mail system will evolve and raise regulatory questions.

Other problems listed by Vezza included security and privacy of information, authentication of messages, usability by non-DP persons, audit trails, message integrity and cost.

Current price estimates, including CPU and transmission costs, make electronic message systems too expensive for commercial applications at the present time, Vezza said. One estimate based on a system now operating on the Arpa network would price a 2,000-character message in the $4 range, but this system, called the Dynamic Modeling System (DMS), uses a Digital Equipment Corp. Decsystem-10 in a time-sharing mode.

More modern cost-effective CPUs and a system tailored to a message system would lower the cost, Vezza said. When a typical message price reaches about 60 cents, such systems will become commercially practical, he predicted.

Among the organizations active in the development of message systems are Bolt, Beranek and Newman, the University of Southern California Information Sciences Institute and Stanford Research Institute.

Such systems are now "actively" being evaluated by the University of California at Irvine, Mitre Corp., the Army Materiel Command and Naval Electronics Center.

IBM Antitrust Trial Journeys to Florida

(Continued from Page 1)

when Judge David N. Edelstein, angered by the defense's line of questioning, barked a refusal to hear testimony beyond 4:30 p.m. on Thursday afternoon.

Both IBM's attorney Robert Mullins and the government's David Hamilton agreed they couldn't finish by then.

Stalemate.

IBM has quite a few months to go before it presents its side in the case, but the defense wanted to take the testimony of Hughes now.

As an engineer hired by IBM in 1945, Hughes was one of four inventors of the Selective Sequence Electronic Calculator, a replacement for accounting machines introduced to the public in 1948. This was the first general-purpose computer system, he testified.

The next machine IBM introduced was the 650, which was opposed by a portion of the company's management as being larger than anyone would want, Hughes said. IBM projected 50 systems would be ordered, but instead it accepted from 1,500 to 2,000 systems orders, he added.

Questions 'Far Afield'

The attorneys couldn't finish their work last week because Mullins took his questioning "far afield of what had been expected," according to Hamilton, who objected time after time and finally told Edelstein the time allotted for cross-examination would not be sufficient.

Observers agreed it is difficult to determine what significance should be attached to Hughes' testimony since no other part of IBM's defense has been presented to set it in context. But it is probably a sure bet that Hughes was the most enjoyable witness the trial has heard to date.

"The affidavits provided by IBM and the physician say nothing about this witness' not being able to travel," Edelstein insisted. "If you want to finish this testimony, you'll have to do it in New York."

In addition to the judge, those traveling to Miami included two attorneys from each party, a court clerk, a court stenographer and the judge's law clerk. The cost of a round-trip coach-class airplane ticket from New York to Miami is $210, and hotel rooms here cost at least $25 per day.

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Laws on EFT Systems:

These charts, prepared by the American Bankers Association, give a state-by-state overview of legislation currently in force which covers electronic funds transfer (EFT) systems.

They detail which financial institutions are covered by law in each state, the nature of a state's bank branching law (S-statewide, L-limited branching, U-unit banking) and whether and under what conditions units owned by out-of-state banks are permitted.

The charts also illustrate whether a state treats remote facilities as branches.

For unmanned remote facilities, each state is reviewed to determine if and to what extent distinctions are made between manned units such as point-of-sale (POS) terminals and unmanned units such as automated teller machines (ATM).

If a state law permits unmanned remote facilities, the law is screened to determine where it permits a facility to be located.

STATE	Applies To	Branching Law	Out Of State Entry	Is Facility A Branch	UNMANNED REMOTE FACILITY							
					Geographical	Functions				Sharing		Advance Supervisory Approval
						Deposits	W D	Pre-auth Loans	A C Transfers	Like	Unlike	
										Institutions		
COMPTROLLER OF THE CURRENCY (Revised Ruling May 9, 1975)	National Banks	N A	N A	No	Within 50 miles of main or branch office	Yes	Yes	Yes	Yes	P[1]	P[1]	Notice only
ALABAMA Act 1127 Laws of 1975	Banks S&Ls CUs	L	Yes Reciprocal only	Silent	Silent	The Superintendent of Banking may authorize activities properly incident to the business of banking						
CONNECTICUT Public Act 75-373	Banks SBs S&Ls	S	No	No	Statewide[2]	Yes	Yes	Yes	Yes	M	M	Yes
FLORIDA Chapter 75-134	Banks S&Ls CUs	U[3]	No	No	Statewide	Silent	Yes	Silent	Silent	P	P	Notice only
GEORGIA Act 169 Laws of 1975	Banks	L	No	No	Limited	← routine banking transactions →				P	P	Yes
IDAHO Chapter 248 Laws of 1976	Banks	S	Silent	No	Statewide	Yes	Yes	Yes	Yes	M[6]	M[6]	Notice only
ILLINOIS Public Act 79-609 Laws of 1975	N A	U	N A	N A	Creates an Electronic Funds Transfer Systems Study Commission.							
IOWA H.B. 1478 Laws of 1976	Banks S&Ls CUs	L	No	No	Statewide	Transactions which are incidental to the conduct of the business of the financial institution."				M	P	Yes
KANSAS S B 515 Laws of 1975	Banks	U	No	No	Statewide	← Banking transactions →				M	S	No
S B 519 Laws of 1975	S&Ls	S	No	No	Statewide	Yes	Yes	Yes	Silent	M	S	No
LOUISIANA Act 241 Laws of 1975	Banks	S	Silent	Silent	Adds incidental power clause allowing commissioner to authorize services consistent with services offered by banks chartered under the laws of the United States							
MAINE Chapter 500 Laws of 1975	Trust Cos SBs S&Ls	S	No	Yes	Statewide	Yes	Yes	Yes	Yes	M	M	Yes
MARYLAND Chapter 515 Laws of 1975	Banks SBs	S	No	No	Statewide (locations remote from main office or branch)	Yes	Yes	Yes	Yes	P[7]	P[7]	Yes
MASSACHUSETTS Chapter 1147 Laws of 1973	Banks SBs S&Ls	L	No	Silent	Limited	Silent	Yes	Silent	Silent	P	P	Yes
NEBRASKA L B 269 Laws of 1975	Banks	U	No	No	Silent	Yes	Yes	Yes	Yes	M	S	Yes
NEW HAMPSHIRE Chapter 233 Laws of 1975 [illegible]	Banks SBs S&Ls	L	Silent	Silent	The Board of Bank Incorporation may promulgate rules permitting any bank or cooperative bank to establish and maintain electronic devices or machines similar to those permitted by the Comptroller of the Currency for national banks.							

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1. Within 50 miles sharing is permissive. A CBCT may be established beyond that distance only if it is available to be shared by local financial institutions.
2. Home office protection provided.
3. Effective January 1, 1977, banks will have limited branching power.
6. To the extent consistent with anti-trust laws, sharing is required.
7. The Bank Commissioner may establish rules and regulations for the operation and sharing of facilities to the same extent and effect as rules and regulations promulgated by the C of C with respect to sharing and operation of facilities by national banks.

Private Sector—Not Government—Should Develop

By Toni Wiseman
Of the CW Staff

WASHINGTON, D.C. – Development of electronic payments systems should be delegated to the private sector rather than to the government, representatives of financial institutions and the government argued here recently.

In testimony before the National Commission on Electronic Fund Transfers (EFT), witnesses also recommended the government only regulate privately run electronic systems instead of operating a nationwide system.

Donald I. Baker, an assistant attorney general in the Justice Department's Antitrust Division, emphasized the need for the Federal Reserve Board to make every effort to commit automated clearinghouse (ACH) operations to the private sector.

"The commission should carefully weigh the evidence that private entities are prepared to supply, on a competitive basis, the same basic services and facilities for data processing and delivery that the Federal Reserve banks currently provide," Baker said.

The very presence of the "Fed," with its potential for subsidizing its services, may deter entry by some private firms, he added.

Until the private sector takes over, there is a need for the Federal Reserve System to "translate into operating reality" its announced intention to publish a price schedule for ACH services, Baker said.

"As long as the government continues to provide services without charge, private incentives to develop alternatives will necessarily be chilled and economic resources inefficiently allocated," he stated.

Likewise, he noted, an artificially low price for ACH operations by the Fed such as one based on short-run marginal costs will encourage overinvestment in ACH-dependent services and will divert invest-

(Continued on Page 9)

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'ACH' Called More Than 'Fed'

WASHINGTON, D.C. – More often than not the term "automated clearinghouse" (ACH) is incorrectly interpreted as being synonymous with the facilities provided by Federal Reserve banks in check clearing operations, members of the National Commission on Electronic Fund Transfers (EFT) were told here recently.

In fact, the term "automated clearinghouse" extends to the activities of all of the participants and the many operations required in the processing of transfers from origination to final settlement, according to Stephen S. Gardner, vice-chairman of the Federal Reserve System's Board of Governors.

The "Fed's" role in such operations essentially parallels its role in the check clearing operation except that the payment information is exchanged on magnetic tape in lieu of paper checks, Gardner said.

In ACH operations, financial institutions create computer tapes of credit and debit items based upon customer instructions and deliver the tapes to their local Federal Reserve automated clearing and settlement facility.

A Federal reserve computer – which is also used for other operational purposes – reads, edits and balances the information on the tapes, sorts according to the receiving financial organization and makes the credit and debit entries in member banks' reserve accounts.

When the processing has been completed, the computer creates output consisting of magnetic tapes and descriptive paper listings. This output is delivered to the receiving financial organization by the same courier system used for delivering checks.

It is important to note, Gardner said, that in this entire process the Federal Reserve interacts only with financial institutions for purposes of effecting clearing and settlement.

All other organizational, operational and legal requirements are between the participating financial institutions and their customers, he said.

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- 80 Education/Medicine/Law
- 85 Government - Federal/State/Local
- 90 Printing/Publishing/Other Communication Service
- 95 Other: ______________________

TITLE/OCCUPATION/FUNCTION

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- 13 Treasurer/Controller/Finance Officer
- 21 Director/Manager of Operation/Planning/Administrative Service
- 22 Director/Manager/Supervisor DP
- 23 Systems Manager/Systems Analyst
- 31 Manager/Supervisor Programming
- 32 Programmer/Methods Analyst
- 41 Application Engineer
- 42 Other Engineering
- 51 Mfg Sales Representative
- 52 Other Sales/Marketing
- 60 Consultant
- 70 Lawyer/Accountant
- 80 Librarian/Educator/Student
- 90 Other: ______________________

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What's Happening Where

The charts also examine whether a facility can accept deposits or dispense cash (W/D); if lines of credit or preauthorized overdraft privileges are available through the units; and whether transfers between accounts, such as savings and checking, are permitted (A/C Transfers).

Each law is examined to determine if an establishing financial institution must share its unmanned remote facility with other institutions and whether such sharing is mandatory (M), a permissive requirement (P) or silent (S).

The laws are also categorized to show whether institutions may or must share with like institutions – banks with banks, savings and loans (S&L) with S&Ls – and with unlike institutions (banks with S&Ls).

Finally, the ABA has examined whether the governmental official with jurisdiction over financial institutions must act to authorize a facility or if only notice of intent is required.

STATE	Applies To	Branching Law	Out Of State Entry	Is Facility A Branch	UNMANNED REMOTE FACILITY							
					Geographical	Functions				Sharing		Advance Supervisory Approval
						Deposits	W D	Pre-auth. Loans	A C Transfers	Like	Unlike	
										Institutions		
NEW JERSEY Chapter 148, Laws of 1975	Banks SBs	S	No	Yes	Statewide	Any business conducted at principal office				P[8]	P[8]	Yes
Chapter 159, Laws of 1975	S&Ls	S	Silent	Yes	Permits establishment with the Commissioner's approval of "limited facility branch offices" which may be fully automated.							
NEW YORK Chapter 764, Laws of 1975	Banks SBs S&Ls	S[9]	Silent	Yes	Permits establishment of ATMs and POS terminals pursuant to regulations of the banking board.							
NORTH CAROLINA Chapter 563 Laws of 1975	Banks	S	No	No	Subject to the rules and regulations of the State Banking Commission, banks may establish manned or unmanned off-premise facilities.							
NORTH DAKOTA H.B. 1542, Laws of 1975	Bank of N.O.	U	N/A	No	The N D State Bank may establish EFT system for its customers and customers of other financial institutions authorized to utilize such services (includes State banks).					M	M	Yes
S.B. 2443 Laws of 1975 (Wild Card)[10]	Banks		Silent	No	Interstate	Yes	Yes	Yes	Yes	M	S	Yes
OKLAHOMA S.B. 590, Laws of 1976	Banks	U	No	No	Silent	Any transaction contracted for at main office				M	P	Notice only
OREGON Chapter 797, Laws of 1973 (Repealed by H S 2644, Laws of 1975	Banks	S	Silent	Silent	Silent except if more than 4 units	← General banking business →				S	S	Notice only for first 4 units, approval for 5th or more.
H.B. 2644 Laws of 1975	Banks SBs		Yes[11]	Yes	Silent	Yes	Yes	Yes	Yes	M	M	Notice only 30 days after installation or removal
RHODE ISLAND Chapter 290, Laws of 1975 (Wild Card)	Banks SBs S&Ls CUs	S	Silent	No	Provides that every financial institution may establish CBCTs to the same extent and only during such periods of time that competing financial institutions federally regulated and domiciled in the state are permitted to provide							
SOUTH CAROLINA Ratification No. 375,[12] Laws of 1975	Banks S&Ls CUs	S	No	Silent	Statewide	← Silent →						Yes
SOUTH DAKOTA H.B. 844, Laws of 1976	Banks	S	Yes	No	Statewide	Business of banking				M	S	Notice only
UTAH H.B. 10, Laws of 1978	Banks S&Ls. CUs	S	Silent	Silent	MORATORIUM UNTIL JULY 1, 1977. Permits Bank Commissioner to authorize experimental EFT systems.							
VIRGINIA Chapter 535 Laws of 1976 (wild card)	S&Ls	S	The State Corporation Commission may adopt regulations defining what activities may be performed at an authorized facility which is not a branch to establish parity with federal S&Ls.									
Chapter 554, Laws of 1976	Banks	S	Silent	Silent	Limited	Yes	Yes	Yes	Silent	P	P	Notice only
WASHINGTON Chapter 166-XXX Laws of 1974	Banks MSBs S&Ls	S	Silent	No	Statewide	Yes	Yes	Silent	Yes	Bank owners M MSBs & S&Ls P	P P	Yes
WISCONSIN S.S. 415 and S.S. 828, Laws of 1976	Banks S&Ls	L	Yes[13]	No	Statewide	"Transactions which are incidental to the conduct of the business" of a bank or S&L.				Banks & S&Ls[14] M Retail owners P	M P	Yes

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8. Commissioner may require sharing with institutions insured by FDIC or FSLIC.
9. Statewide branching in New York effective 1/1/76.
10. Establishes parity with federally regulated financial institutions, including federal S&Ls.
11. Out-of-state bank may use facility if Oregon bank may use facility in home state of non-Oregon bank.
12. Provisions of act effective until July 1, 1977 only.
13. Out-of-state banks may use a facility in Wisconsin if consent is given by a Wisconsin bank using the terminal.
14. Savings banks may share facilities established by either a bank or savings and loan association.

Electronic Payments Systems, EFT Commission Told

(Continued from Page 8)

ment from other areas.

For example, the high front-end costs of on-line point-of-sale (POS) systems have retarded POS growth, he said. As a result, off-line POS systems cleared through the ACH systems may prove an attractive alternative.

"To the extent that government-aided ACH services are not fully priced in a manner comparable to that of private businesses, the ACH-supported service will represent an artificially attractive alternative – despite its shortcomings," Baker said.

A Fed pricing schedule should be founded upon the same economic principles as a schedule adopted by a private businessman, he added.

Baker also expressed concern over the extent to which ACHs, which he said are presently developing as monopolies, will create an environment that promotes or fosters local joint-venture monopolies offering on-line retail banking services.

The threat is a real one, he argued, urging the commission to consider appropriate measures to prevent ACHs from carrying forward their joint monopolies at the clearing level into the delivery of retail, banking and other services.

Government Work Done

Ted Baynes, president of the National Automated Clearing House Association (Nacha), stated no further government role in EFT systems is appropriate beyond its present operation of ACHs.

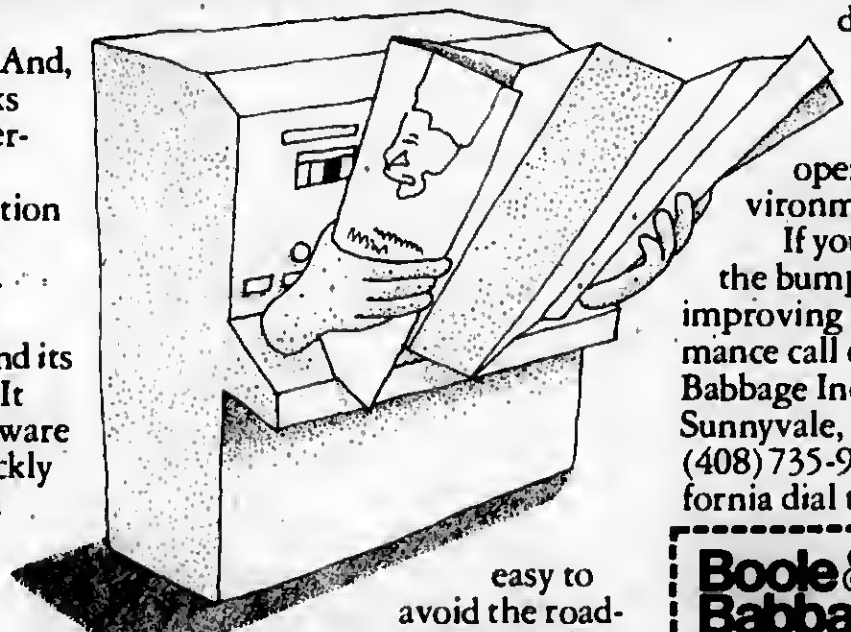
In his testimony, Baynes maintained that payment services should be provided primarily by the private sector and that the public sector should offer payment services only when the private sector will not offer services judged to be for the public good.

Public-sector payments services should only be offered on a fully costed basis so the private sector will not be prohibited from competing, he added.

ACHs should be dealt with separately from other EFT services, he said, because "the ACH concept affects only the media of exchange and does not involve most of the controversial aspects which are in the limelight of the EFT area today."

Nacha's position is that ACH services should not be solely dependent on or controlled by the Federal Reserve System, Baynes said. It is, however, appropriate for the Federal Reserve to provide operational facilities for local and re-

(Continued on Page 10)



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Second State Forces Agency to Halt Sale of Data

By Nancy French
Of the CW Staff

BOSTON – The credit-reporting agency that threatened New Hampshire consumers with sale of their credit files to a giant computerized firm unless they bought back the information has been forced to discontinue the same activity in Massachusetts.

In an agreement recently filed in Suffolk Superior Court here, Wesley C. Pike, president of the Credit Bureau of Nashua, Inc., also promised never to attempt to profit by offering to sell the personal data his firm had collected on Massachusetts consumers.

In a letter Pike sent to about 2,000 Massachusetts residents, the credit bureau offered to sell back to consumers their personal information for $7.50.

The letter said, "We have a credit file which contains all or part of the following information about you . . . your employment, income, martial (sic) status, credit references, how you pay your bills, mortgages, liens, attachments, divorces . . .

"We have decided to give you a chance to obtain sole possession of your complete file before it becomes part of a large computerized data bank which may allow unlimited access by thousands of people.

"It is your privacy. The choice is yours."

The Massachusetts attorney general, who is empowered to file suit on behalf of the Commonwealth, sent Pike a five-day demand letter warning a suit would follow unless he complied with the law.

The agreement Pike signed was an "assurance of discontinuance" provided for under the Massachusetts Consumer Protection Act. That law forbids "unfair and deceptive practices," according to Jonathan Brant, assistant attorney general.

By signing the agreement, Pike did not admit liability or the violation of any law. He merely agreed to clear with the attorney general any such correspondence contemplated in the future.

A similar letter was sent to New Hampshire residents, and their complaints led to court action against Pike by that state's attorney general's office.

The Hillsborough County (N.H.) Superior Court said the letter was "in bad taste," but it found no evidence of fraud or misrepresentation [CW, Sept. 24, 1975].

Nevertheless, Pike discontinued sending the letters in that state as well.

NBS' Davis Gets Service Award

WASHINGTON, D.C. – Dr. Ruth M. Davis, director of the National Bureau of Standards' (NBS) Institute for Computer Sciences and Technology, has been named one of nine National Civil Service League Career Service Award winners for 1976.

The awards program, administered by the National Civil Service League, is aimed at recognizing career public employees for significant contributions, encouraging excellence in government service, promoting public appreciation of quality in government and stimulating youth to choose government service.

Davis has been a federal employee since 1955, when she joined the Department of the Navy as a research mathematician. Since then she has served as head of the Navy's Operations Research Branch, staff assistant for intelligence and reconnaissance in the Office of the Director of Defense Research and Engineering and as director of the Lister Hill Center for Biomedical Communications, National Institutes of Health.

Davis has been directing the NBS' computer research effort since November 1970.

Private Sector Urged For EFT Development

(Continued from Page 9)

gional automated clearing arrangements when requested by local member banks, he noted.

"We feel very strongly that considerable control in terms of rules, procedures and technical specifications must remain in the private sector in order to make the system responsive to changes dictated by the marketplace," Baynes stated.

Stephen S. Gardner, vice-chairman of the Board of Governors of the Federal Reserve System, noted the Federal Reserve provision for automated clearing facilities was not intended to preclude private-sector development and operation of similar facilities.

In fact, two privately operated ACH facilities have recently been established, both of which use the Federal Reserve's settlement systems and will use its check courier delivery system, he noted.

"The role of all participants in the electronic payments mechanism is as yet unclear," Gardner said. "The Federal Reserve has not arrived at specific positions on questions related to its role in the electronic payments mechanism."

J.T. Ellington Jr., senior assistant postmaster, U.S. Postal Service, emphasized the effect EFT would have on the Postal Service, noting almost half of its total earned revenues are derived from handling monthly bills and payments.

"We are concerned particularly with the potential for expansion of direct deposit, preauthorization, debit card usage and similar approaches that would divert valuable mail and revenues from a postal system already beset by financial problems," he stated.

He suggested the possibility of Postal Service involvement in a role conceptually akin to that which it now plays in the present system. An electronic message system would be designed to reduce the relative cost of sorting and transporting a significant portion of first-class mail.

While such a system could be structured to accommodate individual letters entered through lobby walk-in or word-processing terminals, the primary market would be mass mailings such as credit card bills entering the system in digital form.

"There appear to be no major legal or policy questions preventing the Postal Service from operating such a system, but the technical and economic feasibility of the idea has not been operationally demonstrated," he said.

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Editorial

Still Waiting...

IBM has entered the ranks of the mini makers within a carefully defined area that is meant to appeal primarily to the sophisticated, software-wise user.

The Series/1 [CW, Nov. 22] is certainly not an entry-level machine and first-time users would need heavy support from a systems house if they were entering the world of DP with one of these systems.

But IBM has put the stamp of validity on the bare-bones mini concepts pioneered by Digital Equipment Corp. The first minis, like the Series/1, were purchase-only, limited-support systems that took a lot of work on the part of the user or a systems house to make them operational.

Ironically, DEC, Data General and the other leading mini makers have now evolved into suppliers of more applications-oriented systems at the same time that IBM has put its stamp of approval on their original concepts.

The Series/1 was unveiled with limited capabilities and as such will appeal to a limited type of user – at least for now. But the Series/1 will undoubtedly be enhanced upward as IBM decides what features should be added and when.

The architecture, with 16-bit word and byte addressing plus a large instruction set, implies this machine (with proper software) could someday become a large-scale mini, custom-tailored for teleprocessing or other major applications.

For now, the Series/1 is playing catch-up ball in a new IBM ballpark. But, as usual, IBM is on the pitcher's mound on where it will take this system.

And now that the wrappers are off, we have still not seen the simple entry-level business-oriented IBM system. That role may have been reserved for the System/32.

If not, perhaps one day in the not-too-distant future, advanced users of IBM word-processing equipment may get an upgrade into System/0, which might be called Everyman's entry-level introduction into the mysterious world of data processing.

THE MINICOMPUTER SALOON GAME ROOM
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$
Computerworld

'Deal Me In, Gentlemen . . .'

Letters to the Editor

EFT Question Posed by Editorial Permits Only Negative Answer

The editorial of Nov. 15 posed the question: "Is it consistent with the right to privacy to collect all information about an individual's financial affairs in one place?"

The question was raised in the context of electronic funds transfer (EFT) technology. The editorial stated that until that question can be answered satisfactorily, Congress should place a moratorium on all EFT experiments.

Clearly, the question only permits a "no" answer and that answer is not satisfactory. However, for it to be relevant to the issue of EFT, one must assume EFT will result in all information being in one place.

To hold that this would be the inevitable or even the probable result, one would have to be very naive regarding the technology itself, the banking system and information systems.

"EFT" is a broad umbrella that describes a number of applications. The use of the umbrella term seems to contribute more to fear than to understanding since few of the dangers attributed to the umbrella seem appropriate to the individual applications.

If the various applications share anything in common, it is that for security they depend upon the fast flow of current information rather than upon such primitive mechanisms as checks, credit cards, passbooks, tokens and bank notes.

Like the primitive technologies, EFT will provide security with some residual risks. The new technologies can be expected to replace the old only partially and only to the extent they are successful in reducing risks.

In the end, we will have more mechanisms, not fewer. Bank notes did not replace coins, checks did not replace currency and credit cards did not replace checks. The increase in mechanisms will increase the individual's tools and choices for maintaining his privacy.

The U.S. banking system, and indeed that of the world, is also pluralistic. Banking institutions are chartered by many jealous sovereigns, each determined to maintain its own control. The Federal government alone charters four different kinds of banking institutions: Federal Reserve banks, national banks, federal savings and loans and federal credit unions, not to mention regulatory and insurance agencies.

The trend seems to be in the direction of increased competition among these institutions. Many people who formerly dealt with only one type of institution now deal with two or more and often more than one of each type.

I am all for dialogue, but this one has already been long and somewhat one-sided. I am for safeguards, but let's not fail to implement those required for today.

W.H. Murray

Norwalk, Conn.

Command Incorrectly Converted

In his article [CW, Nov. 15], M. Curtis Stordahl Incorrectly converted PL/I's DO WHILE C into Cobol's PERFORM NEST-4 UNTIL C. The correct Cobol equivalent is IF NOT C THEN PERFORM NEST-4 UNTIL NOT C.

A better solution in the future would be to permit inline block structures in Cobol via the DO and ENDDO and, possibly, the DOWHILE constructs.

Larry Kintisch

Spring Valley, N.Y.

(Other letters on Pages 14, 15 and 16.)

Data Past

Five Years Ago
Dec. 8, 1971

WASHINGTON, D.C. – The American Committee on Africa announced computers were "the key U.S. contribution" to South African apartheid. The committee, which called itself a "support group for the liberation movements in southern Africa," said a computer system would be used to compile dossiers on all blacks in South Africa.

– – –

WASHINGTON, D.C. – Criminal justice agencies in "about 10 states" went on-line with the Computerized Criminal History (CCH) file of the FBI, according to an official here. These agencies included police, courts and corrections institutions.

The CCH increases the likelihood of obtaining "last minute" criminal data instead of obtaining records of arrests without dispositions, he said.

Eight Years Ago
Dec. 11, 1968

STAMFORD, Conn. – Using a Type 3 IBM software package on a single processor 360/67, a time-sharing service here was able to give its users more memory space for programs than the internal capacity of the system. The service, operated by Computer Software Services (CSS), was capable of running programs requiring up to 16 million bytes even though it had only a quarter of a million bytes of core storage physically available.

– – –

SAN FRANCISCO – Thomas J. Mellon, this city's chief administrative officer, announced election day errors in computerized vote tabulating had been traced to human error. "The breakdown came during the process of converting the results from the voting machines to the scanner sheets," Mellon said.

Personal Initiative Seen Key to DP Career Growth

The Human Connection

By Jack Stone

Special to Computerworld

First, a note of appreciation to the many respondents who answered my survey on the status of women on DP staffs [CW, Oct. 4]. The high volume of comments has made it impossible to acknowledge each letter individually. However, extracts of selected letters will be published, along with an analysis of the survey, soon after the questionnaries stop arriving.

After reading the letters and comments that have already been received, I noticed one particular theme was recurrent and consistent: Any individual, man or woman, armed with driving initiative, strong desire and the willingness to work hard and long can enter, grow and prosper in most DP positions.

The exceptions are those positions for managers where the competition is keen and those positions for highly technical people where specialized education and training are required.

A fine example of such a successful career program is portrayed in the following letter from Martha Collaer, who made the transition from clerk-typist to DP manager.

Dear Jack:

As a female DP professional of some 15 years, the idea of your survey was of great interest to me; and I feel my observations may be of equal interest to you.

First of all, I will make the general statement that in the computer industry, as well as in most other industries, women do not have an opportunity equal to that of their male counterparts.

On the other hand, they may well be more equal in DP than their sisters in other professions. I know of few women in other areas of business who can hope to achieve the income level of the female DPer.

Superior computer programmer/analysts are in great demand, regardless of sex, and a female who is able to achieve this kind of reputation is going to make a better than decent living.

To move into management is quite another thing. Those walls are still fairly secure, the reason being that a woman comes into head-to-head competition with the very best of the male professionals and, all other things being equal, the male has the edge.

In my somewhat long experience, I have had two management positions. In both instances part of the reason I was able to secure these jobs was the fact that my experience and ability were far, far superior to that of my male competition at the same salary level.

To have hired a man with my qualifications would have cost the company at least 35% to 50% more. (My income over the past few years has placed me in the upper 1% of salaried females, according to a survey in *Business Week*).

At the level of programmer or systems analyst, however, I feel women can demand and obtain equal pay for equal work.

As to your question; whether I feel the secretarial staff is a viable source of personnel for junior DP positions, my answer is maybe. As a DP manager in a relatively small shop, I certainly would have given this opportunity to any clerical female in the company; and yet not one female employee in the organization ever showed the slightest interest in a DP position, even when openings existed.

Not even within my DP department, where my secretary and clerical employees were encouraged, even pushed, was there much indication that these women wished to learn to program or operate the computer, except at a highly supervised level.

I graduated from college in 1959 with a degree in government and English. I went to work as a clerk typist for $275/mo. I was not satisfied with that because I knew I had more sense than most of the men for whom I worked.

When new positions opened, I requested that I be considered for promotion; if I wasn't, I went looking for another job. I begged to learn new things and I worked long and hard at work I was not being paid to do.

During the first three years of my working life, I was working beyond my responsibilities and was receiving low pay. I took advantage of every opportunity to learn.

My entry into DP was accidental: the young man who was my supervisor didn't want to learn our old unit record equipment; the woman with seniority didn't want to stand on her feet all day; and I was willing to try anything once.

And so, my advice to secretaries is this: If you think you would like to learn DP, go to the DP manager in your firm and ask to take an aptitude test. If he won't give you one, get one from a vendor or an employment counselor or at a school.

If you pass the aptitude test, tell the DP manager you would like very much to transfer into the DP department at the very first opportunity. If that is not possible in your organization, find another organization where it is possible; leave no stone unturned.

Then work, work . . . learn, learn. Be willing to stay late, volunteer for every job. I guarantee you will prove yourself indispensible and then you will be on your way.

No manager in his right mind would deny this kind of employee a chance to grow. And if you think it's tough now, you should have been there in 1960.

For every 20 or so employers who will not give women a chance, there is one who might. Find him.

Martha Bullock Collaer

Amarillo, Texas

Letters outlining questions, issues or situations pertinent to human relations in the DP setting may be addressed to Stone, c/o Computer Education International, Inc., Suite 222, 2233 Wisconsin Ave. N.W., Washington, D.C. 20007. Please include self-addressed stamped envelope if acknowledgment is requested.

Another Security Approach Steps Beyond Passwords

The Taylor Report

By

Alan Taylor, CDP

One of the strongest objections to data base operations has been the almost total failure of any "password"-based security system to be much more than an avoidable accounting operation.

Security of data has been practically relegated in such systems to relying upon ineptness of thieves and complexity of storage accesses – a security which is doomed to failure as time goes on.

A more thorough type of security, particularly designed for relational data bases but apparently usable elsewhere, has been suggested by Patricia P. Griffiths and Bradford W. Wade of IBM's San Jose Research Division.

Their system ("An Authorization Mechanism for a Relational Database System," *ACM Transactions on Data Base Systems*, September 1976) asks the data base users to set up authorization rules whenever they set up a new table. This is in direct opposition to having some data base administrator set up the rules.

Moreover, the user-provided rules can provide for subsets of the data base itself that can be used by particular users, as well as put restrictions upon the type of use the first user can have.

'Viewing' Method

Segmentation of the data is handled through "viewing." A "view" of data is not physically stored, but can be computed from the stored data. For instance, a view consisting of the names and salaries of the employees who work in the toy department can be defined as:

```
SELECT NAME, SALARY
FROM EMPLOYEE
WHERE DEPARTMENT = 'TOY'
```

This particular view permits copies of actual data to be provided, but manipulation of the instructions can restrict the data to statistical summaries. For instance, a view defined as:

```
SELECT AVG(SALARY)
FROM EMPLOYEE
GROUP BY DEPARTMENT
```

would provide the data to be published – average salaries by department – but not the data used in preparing the view.

The method the table-builder has of authorizing access to the tables is through GRANT and REVOKE commands. In the first place, the person setting up the table is the only person who has the right to say how it should be handled. Everyone else is excluded; it is his private domain.

With this set firmly as background, he can use five types of rights to user lists and can permit delegation of the GRANT provision itself. A GRANT command can look like:

```
GRANT READ, UPDATE, DROP ON
(table) TO (user-list)
WITH GRANT OPTION
```

READ permits access to the table or some of its views; UPDATE allows the person getting update privileges to modify existing data; DROP permits the grantee to actually delete the table from the system. INSERT and DELETE are the other two available commands, allowing the insertion or deletion of rows from the table concerned.

Granting views is similar, but not identical, to granting access to actual tables. Again, the basic theory is that only the person who sets up the view can have access to the view or can grant others such access.

However, as a view is set up from one or more tables in the first place, the person who has set it up needs a second user and not the original table-creator. As such, he can't grant authority that he himself doesn't have.

If a view is related to two tables and the view-creator has read-only privileges on only one of those tables, then the most he can grant is the same read-only privilege – no matter how widely he is authorized for the other table.

Here, also, the last phrase of the GRANT command comes into play – WITH GRANT OPTION. Unless this option has been provided on all underlying tables, the creator of a view can't do any granting.

An oddity here is that a user who has been granted a view need not have access to the underlying tables. This way the grant-option permits such secondary use of otherwise inaccessible material without further authorization and has some of the aspects of the need-to-know security theory built into it.

System R

The system is being implemented by Griffiths and Wade in a relational data base, System R, currently under development. Clearly it can be expensive in time (see accompanying diagram of the revocation algorithm).

Some savings of time are possible by noting authorization is frequent, but revocation is rare – which suggests checking that the rights of a user have not been revoked has a low return, in the sense of few rejects.

In System R, this is being faced by permitting access based on transactions, rather than on individual data accesses. In System R, a transaction is defined as a group of commands to the user interface.

Within any particular transaction, when the first access to a table is requested, the right of the user is checked including revocation. The results are placed on a scratchpad and used for any subsequent access to the same table, within the same transaction.

Misdirected Step Ahead

All in all, the Griffiths-Wade system is a definite step beyond passwords, but it falls woefully short of today's needs and, to some extent, appears to be misdirected. It doesn't, for instance, record who has accessed what – a vital requirement for today's privacy systems. Nor does it record just how a particular user gained access to some data.

True, the authors noted they do not try to protect information from misuse by authorized users just passing the data on, but whether this acknowledgment is enough warning to potential believers that System R really does provide secure data is, in my eyes, doubtful.

```
REVOKE:  procedure(grantee, privilege, table, grantor);
  comment  turn off the grantee's authorization for (privilege) obtained from (grantor);
  set (privilege) = 0 in the (grantee, table, grantor) tuple in SYSAUTH;
  comment  find the minimum timestamp for the grantee's remaining grantable (privilege)
    on (table);
  m ← current timestamp;
  for each grantor u such that (grantee, privilege, table, u, grantable) is in SYSAUTH do
    if privilege ≠ 0 and privilege < m
      then m ← privilege;
  comment revoke grantee's grants of (privilege) on (table) which were made before time m;

  for each user u such that (u, privilege, table, grantee) is in SYSAUTH do
    if privilege < m
      then REVOKE(u, privilege, table, grantee);
  return
```

Implementation of the authorization system of System R is performed through algorithms controlling the various commands. The one above handles the REVOKE command.

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Letters to the Editor:

Schecter's Premise Basically Incorrect

Computerworld really should be more careful. Apart from several typographical errors in the enumeration of Julian dates by David Schechter [CW, Nov. 8], the basic assumptions of the article were wrong. I do hope no one has already programmed it.

There are not a fixed number of days in a century. The 20th century has only 36,500 plus 24 leap-year days (not 25), since 1900 is not a leap year.

This is because there are 365.242 days in a year and the adjustment of one day every four years requires an adjustment itself every 400 years. Thus 1600 and 2000 are leap years, but 1700, 1800 and 1900 are not.

Schechter's formula thus requires the constant subtraction of .25 in each calculation to give correct answers. Correct, that is, except for all dates in 1900 for which it gives a wrong answer (the day number 365, indeed, is impossible with this algorithm).

More accurate is the formula:

```
yy * 365.24 + ddd (as opposed to
(yy * 365.25) - 0.25 + ddd)
```

But even better (albeit tongue-in-cheek), as we all try to write programs for posterity as well as prosperity, would be

```
(yyyy - 1973) * 365.25 + ddd (taking
Jan. 1, 1973 as day 1)
```

which would work until Dec. 31, 2100, by which time we all should be past caring.

Brian Lewis
Vienna, Austria

Another Alternative

Edward C. Imperatore [CW, Nov. 22] realized there aren't 25 leap years in a century, but his modification of David Schechter's five-digit number (FDN) formula did not use that knowledge properly.

The FDN formula still will not work in the 21st century because it stated Jan. 1, 2001 and Dec. 31, 2000 are the same FDN (00366).

Donald J. Ramig realized Schechter's FDN formula wouldn't work in the 21st century, but he didn't understand why. Ramig's seven-digit number (SDN) formula doesn't work in the 20th century; there seems to be an extra day between Dec. 31, 1900 (SDN=0694339) and Jan. 1, 1901 (SDN=0694341). This error, if accumulated for 10,000 years, would become 75 days.

Larry Runtsch showed his knowledge of date-handling methods and an understanding of why Schechter's FDN formula won't work in the 21st century. He went on to tell they've invented a date called Mega which converts July 4, 1976 into 721,905 and that this date transcends both years and centuries and can easily be used to calculate elapsed days and the day of the week.

With all these people trying to help develop a date numbering technique for our calendar which would allow us to do simple elapsed-day calculations, I decided to give it a try.

I started with the rules for our Gregorian calendar which are: every year has at least 365 days, every fourth year is a leap year (has one extra day) and every centessimal year not divisable by 400 is not a leap year.

From this I wrote:

```
Data Number (DN) = INTEGER
(YEAR * 365 + YEAR * 24/100 +
(YEAR -1)/400) + DDD
```

which reduced to:

```
DN = INTEGER ( YEAR*365.2425-
.0025)+DDD.
```

The DN produced for July 4, 1976 becomes 721,905 which is the same as Larry Runtsch's Mega date.

John David Dilks Jr.

Formula Wrong by 1

The minor storm stirred up by David Schechter's proposed five-digit number (FDN) attracted my attention. As was pointed out by other readers, there are 97 leap years every 400 years according to the Gregorian calendar, and we will probably abandon the entire system for other reasons.

The thing that caught my attention is that Schechter's formula simply does not work for the year 1900. According to his formula, Jan. 1 has an FDN of 0 and Dec. 31 has an FDN of 364. It does, however, give the correct value from Jan. 1, 1901 to Dec. 31, 1999.

Further, the formula, even with the correction proposed by Edward C. Imperatore, will be in error by 1 throughout the 21st century.

James F. Keegan
Paramus, N.J.

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Julian Date Debate Continues

Would You Believe...

Regarding Schechter's date conversion method [CW, Nov. 8], would you believe:

```
DN =integer ((YYYY * 365.25) - .25
   - integer ((YYYY - 1) / 100)
   +integer ((YYYY -1)/400)
   +DDD
   +k
```

Donald J. Ramig [CW, Nov. 22] forgot the Gregorian Leap Year rule provides for dropping a day from every year ending in 00 whose number cannot be evenly divided by 400. (Both Peter F. Klammer and Edward C. Imperatore noted this). Thus, years 100, 200, 300, 500, 600, 700, 900, 1000, 1100, 1300, 1400, 1500, 1700, 1800, 1900, etc. were not leap years. Hence, there are not 3,652,500 days in the 10,000-year period noted by Ramig.

There are 3,652,424 days in this period according to my formula, where k = 0. However, since Pope Gregory XIII decreed only 10 of these 12 years from 0000 to 1582 should be used in his correction of the calendar, k should be 2. With this change there are 3,652,426 days in the 10,000-year period.

By the way, does anyone have a method for figuring out what date Easter will fall on for the 10,000-year interval beginning with year 0000?

James Hammill

Pleasant Hill, Calif.

Confusion Corrected

Peter F. Klammer's article was absolutely correct and he was absolutely right in taking strong exception to David Schechter's description of the term "Julian" date.

The mystery which Klammer was concerned with may be explained by the fact the Julian date begins at 12 noon; consequently the design to calculate the Julian date in the absence of any time information generally gives the date as a string of digits followed by a decimal point and the number 5.

For once, the confusion between the year and day of year, the serial day of the year and the Julian date has been laid to rest, hopefully for the last time.

A.L Bender

Westwood, N.J.

And in Self-Defense...

Peter F. Klammer's article [CW, Nov. 22] erroneously charged me with misappropriating the term "Julian" date. According to the "Burroughs Coboi Reference Manual for the B2500 and B3500 Systems" (1033099):

"Date (Julian). This special register contains the current Julian date and is maintained by the MCP. Its format is YYDDD. For example, if the current date were Jan. 1, 1968, the DATE register would contain 68001. The function of DATE is to save programmatic evaluation of TODAYS-DATE when Julian dates are required. DATE is maintained in COMPUTATIONAL form."

Klammer's quarrel is with Burroughs or commercial DP usage rather than with me.

As to the other comments:

Larry Runtsch was correct in stating 1900 was not a leap year. That is why my formula; FDN = integer ((YY * 365.25) -.25) + DDD (as corrected by Edward C. Imperatore) contains the subtraction of .25.

Joseph W. Begasse was correct that IBM 370 binary arithmetic operations on 16-bit fields will yield negative numbers when the high-order bit becomes 1. It is my assumption that anyone using the data compaction technique I recommended would realize this and, accordingly, will rightly justify the 16-bit field in a fullword that has been previously loaded with binary zeros prior to making any computations.

Donald J. Ramig's observation that my technique is useful for only the next 23 years was well taken. But the limiting factor is really the fact that in commercial systems we normally capture only the last two digits of the year.

David Schechter

New York, N.Y.

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Reader Commentary

Take Printouts, for Example

Simple Solutions Often Cure Intercompany Bickering

By Paul B. Riser

Special to Computerworld

In big businesses that have their own DP centers, intercompany bickering arises because of a lack of communication or because of small problems from equipment malfunctions or breakdowns in the data center.

Since the lack of communication between departments is an administrative function, I will attempt to help resolve one problem that constantly confronted my own company's data center: off-line computer printouts.

When computer functions for a company are performed within the company rather than by a private service, the quality control of off-line computer printouts is not and sometimes can not be regulated.

And when another department receives its printouts in a less than legible or complete form, static between that department and the data center occurs.

Although incidents such as this cannot be avoided completely, they can be corrected in companies with multiple printers and/or tape drives with more speed.

The problem that confronted my company occurred because several departments were receiving printouts that had a few characters dropped on each page. This would not have been too serious if not for the fact that one of those characters was sometimes part of an important number or a letter that could change the meaning of a word or sentence.

What we did was change the printing program so the printer number, tape drive number and the date printed were included on the first page of the printout.

By using this method, the offending printer and tape drive could be pinpointed and checked out for problems; previously it had been necessary to check out all of the printers and tape drives.

This saves maintenance time and operation downtime. After all, the main purpose of computer operations is to save time and money.

Letters to the Editor

Too Much Flapdoodle About Date Storage

What is all the flapdoodle about better ways to store dates in files? *Computerworld* is publishing a lot of garbage on this subject, all of it by engineers of inefficiency who have not yet heard of that marvelous machine – the stored program computer. They seem to be concerned more with abstract ways of using data than with efficient ways of storing it.

As a programmer cum systems analyst, I prefer to store all information on a computer in two forms simultaneously: computer-usable and human-readable (I believe this is called external decimal by IBM).

Similarly, I prefer to store dates in the form JAN. 01 1977. When computations are necessary, these items are converted to their most usable format by that marvelous invention – the stored program.

Okay, so a few more CPU cycles are utilized to convert the data from the most useful form to the most usable form. Generally, for small systems, the total amount of extra CPU time over a year will be small in comparison with just one attempt by a human to make sense out of one of these efficient pieces of data.

My deadlines are more important to me and the company than a small additional load on the CPU.

James G. Gervais

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Computerworld 12-6

Without Regulator, DP Professionalism Only a Myth

Reader Commentary

By Louis Fried

Special to Computerworld

For several years there have been many articles, discussions and meetings aimed at establishing data processing as a "professional" field. A great deal of effort has been expended by organizations, even to the development of a "professional code."

Some of these efforts have resulted in significant benefits to the field in general. However, all the exertion directed at acquiring professional status is wasted time and wishful thinking.

Drawing on the examples of doctors, lawyers and athletes, there appear to be four criteria necessary for a field to be recognized as a profession:

- Established standards of education and expertise for entry into the field.
- Standards of continuing performance in the field.
- Standards of ethics.
- A sanctioning body for control and licensing of practitioners in the field.

While there is no disputing the need for professionalism in DP, there is clearly a question as to the possibility of DP ever meeting all the criteria for professional status.

Although most computer people in the field today have acquired their skills through apprenticeship rather than formal education, this is a time-honored way of achieving professional status.

Standards of education, tests of expertise, standards of performance and standards of ethics can, and have been, established. But the concept of professionalism lies not only in qualifying for the field, but in control of the performance of the professionals.

A doctor, lawyer or even a professional athlete can be denied the right to practice if he fails to meet the standards of performance and ethics at any time *after* he has qualified.

The creation of standards assumes the freedom of choice on the part of the professional to say "no" to any action that violates the standard. In other words, the essence of professionalism lies in the independence of the professional.

Several factors may contribute to that independence. These include a diversity of clientele representing multiple sources of income, a shortage of the skills involved permitting ease of reemployment or uniform regulation and control providing appeal to an independent body.

But the "professional" whose entire livelihood is dependent upon one "client" (his employer) does not in fact have a freedom of choice. The "captive" professional has only the freedom to comply with the demands of his employer or quit.

Of course, there are individuals who will choose to act in accord with their ethical principles regardless of the consequences. And there are many individuals in the DP field who will act in a truly professional manner at all times and in all circumstances.

But the discussion of professionalism for the DP field centers around licensing and enforcement for all members of the field. The vast majority of members of existing professions may protect their independence either by contract or by their role as individual practitioners. This majority can therefore set standards the minority of captive professionals must observe.

In our present environment, the vast majority of DP people are protected neither by contract nor by independent status. Dependent for his livelihood on his employer and not able to quickly market his skills without some personal loss, the DPer has a greater incentive to ignore professional standards than to uphold them.

Until the individual in DP has a greater incentive to comply with the standards than to ignore them, or would suffer a greater penalty (such as disenfranchisement) upon conviction of a violation, there will be no true independence of choice and no true professional status for the field.

Considering the alternatives, the most expeditious way to achieve the goal of professionalism is through the establishment of an independent federal regulatory commission.

Without this or a similar control mechanism "professionalism" for DP will always be a myth.

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Bill Dierkes, VP Information Systems,
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"What I found out really amazed me. Naturally I expected the terminals to be reliable, and I expected Sycor to back them up with good service. But even I was surprised to find that, when a station went down, *80%* of the time it was back up again in four hours or less. And *95%* of the time in eight hours or less.

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Beyond fast maintenance and reliability, Bill Dierkes has found many other benefits from his network of Sycor intelligent terminals.

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Reader Commentary

Documentation's Value Enhanced If Writer Covers Three Bases

By Richard Zaneski

Special to Computerworld

System documentation requires accurate technical data, detailed organization and a basic design philosophy. If one or all of these points are not covered fully, the written product will be ineffective.

To prepare well-structured system documentation, formalized standards must be established. In a standardized framework, all areas of information are clearly defined.

An efficient method of formalizing system documentation is dividing the information into three general areas — design history, design data and related work procedures.

The design history traces the life cycle of the system, outlines future considerations and illustrates any detailed control features. If all areas are covered fully and written in depth, a system design philosophy will become apparent.

To ensure this fact, documentarians should develop the following key points.

- *Chronologic System Diary.* Outline all details in a system's development from inception to implementation. Highlight all mistakes and any corrective procedures taken. Also, detail the successful progress of the system on a daily basis.
- *System Controls and Audit Trails.* Describe the steps necessary to control system functions in a daily work environment.
- *System Constraints and Assumptions.* List all constraints and assumptions that influenced the design approach.
- *Planned Innovations.* Describe all developments that will be used in the future.

Once an in-depth picture of the system's design is shown, document all technical data in detail. The following points should cover all pertinent areas:

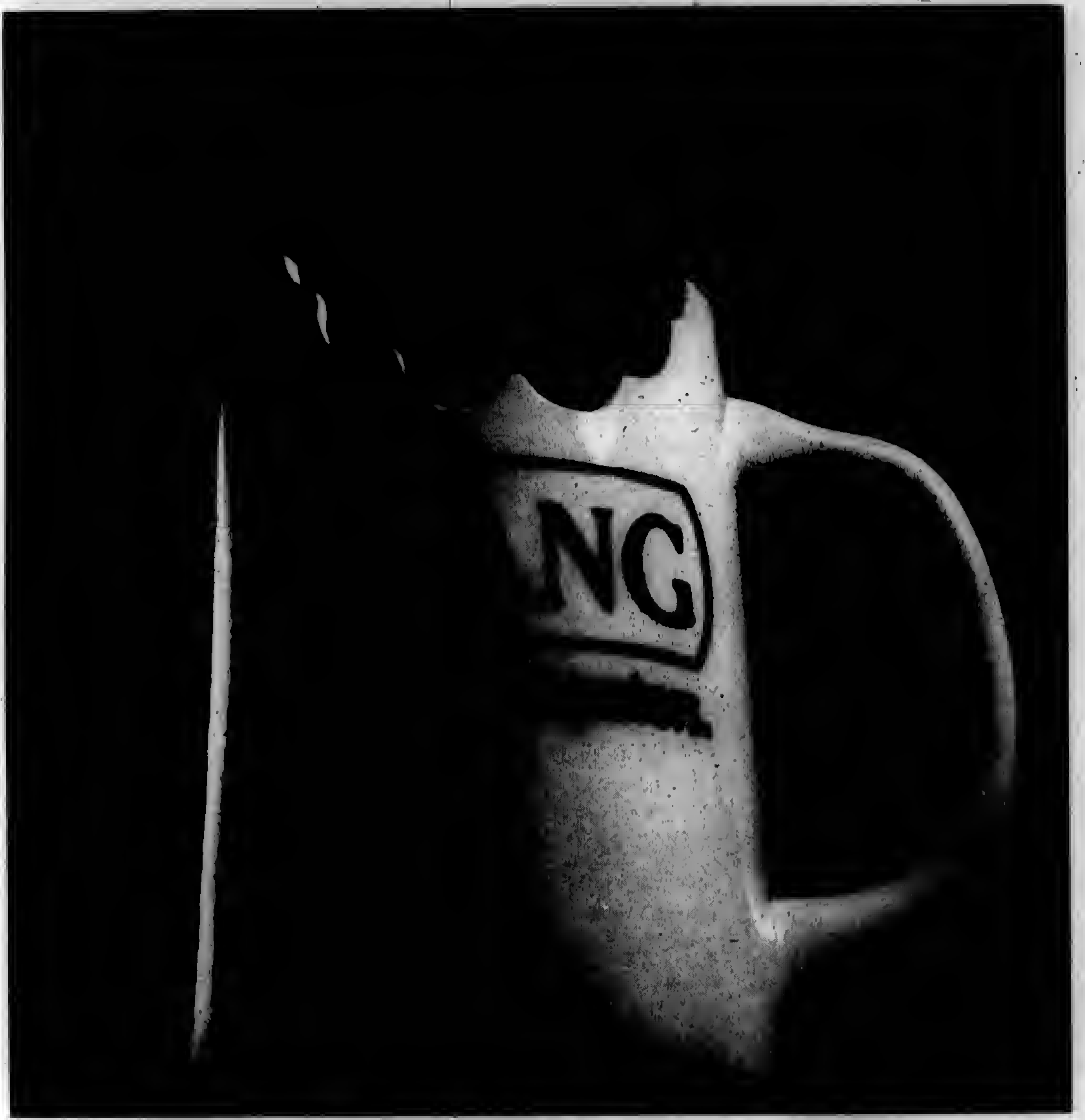
- *System Overview.* Write a narrative description of the system and supplement it with a flowchart. If there are subsystems, show how they interface with the overall system.
- *File Identification.* This section should contain the descriptive material on all files, showing their data fields; the location of files on disk packs using an illustration; overflow extents; volume capacities; and retention records of each file.
- *Input and Control Card Descriptions.* Show all card layouts in a tabular format. Indicate the conditions under which they are submitted and to which program.
- *Input Form Descriptions.* Show actual copies of the forms if available. Describe each and how to complete it.
- *Program Descriptions.* Include data on program function, input and output files, work and reference files, output reports, run frequency, program logic and related program flowchart, input and control cards, console messages and required actions, most current job control language and interrelationships with other programs and systems.
- *Utility Module Descriptions.* Cover the same categories of information as shown in the program descriptions.
- *Report Descriptions.* Provide current report layouts and actual copies of the reports, if available. Include data on report function; field definitions; sequence of information; totals; frequency of use; distribution, retention and disposition; number of copies to be printed; products each program; and special conditions.
- *Code Listings.* In a tabular format, list all codes used on forms and reports.

After the technical areas of information are documented, the system can be related to the human element. This documentation phase should show every job function used in a daily work environment.

Divide the functions into the categories of clerical, control, scheduling, operations, bursting and decollating, security and miscellaneous.

As a general rule, be flexible and receptive to change in preparing the three sections of system documentation. Gear the finished product to the systems and programming staff and related DP departments.

If well-organized system documentation is produced that generates a design philosophy and details all technical data, other areas of documentation can be developed.



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Small computers. CW 12/76

Convict Shouldn't Be Deprived of a DP Education

By Kenniston W. Lord Jr.

Special to Computerworld

Amidst the brouhaha of gun control legislation referenda, a new Internal Revenue Service (IRS) bill which makes extensive use of the Social Security number and the long, drawn-out affair of U.S. vs. IBM, now we hear an inmate at Leavenworth might have used a computer to defraud the IRS of tax revenues.

And while little has been written about it other than the reporting of the incident, J. Daniel Couger has postulated a very interesting question [CW, Oct. 11]: Should a computer be placed into the hands of a known criminal?

He concluded we have done little to teach ethics as they relate to DP and, since we have done such a miserable job there, to place such a tool at the disposal of a convict population demonstrates a lack of wisdom on the part of some official somewhere.

Perhaps there is nobody more concerned about the safe use of a computer than I. But to make such a statement and to draw such a conclusion is, at once, both absurd and begs the basic issue.

Personal Experience

Like Couger, I was approached by an inmate of the Leavenworth program for some publications I produced some years ago.

Through a rather lengthy correspondence with this inmate, I found him to be well-educated, articulate, extremely bright and patently ambitious. If memory serves me, he was an ex-stock broker, had an IQ near 150, was a member of Mensa and had an extreme thirst for knowledge about DP.

Whether or not he was repentant I had no way of knowing, and I never did ask why he had found his way to the federal prison. I do recall he was looking forward to parole and to a DP job somewhere in Wisconsin.

Couger suggested these are the kind of people who ought to be kept from a computer, for since they have proved their lack of trustworthiness, it therefore follows that lack of trustworthiness can get translated into lack of trustworthiness by means of the use of a computer.

Speculation Remains

Perhaps. And then, perhaps not, for there is still speculation as to whether the inmate who, it is alleged, has defrauded the government was able to do so prior to access to the computer and without its assistance.

Couger suggested since there is a possibility the leopard may not change his spots anyway, there is little use in providing a data accelerator for him to perform his dastardly deeds.

It's unfortunate Couger's article did not deal with the recidivism rate of inmates who have completed that particular program of rehabilitation. I think we could draw all kinds of generalities about the people who have free and open access to computers and how they may perform such deeds undetected. As was pointed out in a recent article, the most successful computer frauds have not yet been discovered.

There is no doubt there is some form of recidivism among ex-convicts, even those from Leavenworth. No, I would not be one to hand a gun to an inmate who had been convicted of armed robbery. But, at the same time, it must be remembered DP is a learned intellectual endeavor.

Someone intent on using that intellectual endeavor in an unlawful or dangerous manner will most probably use it that way. My correspondent was extremely bright – a genius. There is no way to keep him from learning about DP if it interests him.

So, too, it would seem, is the situation which fits the inmate charged with breaking into the IRS files. If the individual involved was smart enough to find a way to do what he is accused of doing, then, so motivated, there will be nothing which can stop him.

So there now remains the basic question and the one which Couger really avoided: Should not a system which someone wishes not to be penetrated be designed to be impenetrable? Should not a system which contains sensitive data not be accessible to someone with no reason to have access to that data? Of course.

The simple fact is this: Those systems which we have classified as "secure" are, in many cases, anything but secure. We go to great lengths to assign passwords which are easily broken.

In my security inspections, I still find passwords consisting of the people's initials, dates of birth, Social Security numbers and the like. I find, as I look through organizational practices, a total disregard of the value of the data contained on many files.

In short, until we, as practitioners of the art (or science, if you will) take the situation seriously, anyone with the interest or the skill can gain access to the data.

Jerry Schneider proved that; by his own admission, he didn't have to be a technical wizard to do so.

. . . And in This Corner

To suggest an inmate graduate of a successful rehabilitation program will be prone to go out and crack such a system merely because of his personal history really begs the question of why the systems were developed so loosely in the first place.

Couger was correct, however, in this case by demonstrating the need for inclusion of ethics modules in a training curriculum. He recognized that such is part of the fabric of a profession.

However, he, like you, should recognize adherence to ethics is but part of the fabric of a profession and that the other parts, including personal accountability under law, are a must before the situation is to be corrected.

In the meantime, and while we wait for the industry to come to that conclusion, the safest way to make a system safe is to make a conscious attempt to penetrate it under controlled circumstances and then to plug those holes.

But let us not denigrate a program which is working successfully for the actions of an individual who would misuse it. If the system can be penetrated by one of those individuals, it can be penetrated by anyone.

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Avoids Potential Conflicts

Free Code Said to Manage IBM Control Block Usage

By Don Leavitt
Of the CW Staff

GARDEN GROVE, Calif. – Possible conflicts between competing uses of IBM OS and OS/VS control blocks may be averted by a chaining technique developed by and being offered free by Jerry G. Slater, president of Tone Software Co. here.

For some time, Slater explained, "ingenious" systems programmers have used fields within the control blocks for their own data storage. Use of a field by one program, however, generally precluded use of the same field by another since no method had been developed to save/restore values found in the fields when they were needed by a program, he added.

Conflicts were avoided because the whole installation knew which control block fields were used. And that worked fine until the recent surge of interest in proprietary packages that often use control block fields for their own purposes without documenting such use, Slater said.

Among the control fields which are in demand are the CVTUSER, TCBUSER, TCBTRN and TCBTSFLG, according to Slater, who added, "IBM does not guarantee the future availability of any fields except CVTUSER and TCBUSER."

To help himself – and now the wider DP community – Slater has written three macros and a Type 2, 3 or 4 Supervisor Call (SVC) instruction for the purpose of chaining control blocks from the two fields IBM will guarantee to the user.

Slater is prepared to distribute the code in a hard-copy listing free to anyone who wants it enough to send him a self-addressed, stamped "business-sized" envelope.

He has "neither the time nor the inclination" to serve as a clearinghouse in the event errors (and solutions) are found, Slater said.

The SVC was designed in such a way that the SVC number can be any one that is available to an installation, and neither the systems programmer or the software provider needs to know the number, Slater claimed.

The code "seeks out the SVC number the installation has defined and uses that," he explained.

There are numerous ways in which the coding may be used, Slater said, adding as an example that – until now – it has often been "difficult to pass parameters between programs and subtasks or programs and asynchronous exits."

Since adding, retrieving, changing and propagating of the control block fields will now be possible, "many hardships should be alleviated," Slater claimed.

Tone Software has tried to maintain a good working relationship with all software vendors and "we hope this code will be of value to all who utilize IBM's control blocks in their own products," Slater said.

The free distribution "certainly means vendors are welcome to the code since it will obviously be in the public domain," he added.

The modification will be in the next release of the Tone III package and will be available at all Tone customer locations during the first quarter of 1977.

But, Slater emphasized, "this in no way implies the code for this modification is applicable only to VS1 or to Tone customers."

Tone is at 11588 Trask Ave., Garden Grove, Calif. 92643.

DEC Tells Features, Not Price Of Software for Large Systems

MARLBORO, Mass. – Along with the addition of hardware in its Decsystem-10 and Decsystem-20 line [CW, Nov. 29], Digital Equipment Corp. announced a range of software enhancements for all models of both series.

Updated Fortran and Cobol compilers, an extended APL, a conversational PL/I subset, an enhanced data base management system (DBMS) and an interactive query language were the major products. A sort/merge with a true merge capability is also available, DEC said.

The enhanced Fortran IV is said to have "greatly improved" error-handling facilities at runtime. These include error exits on OPEN and checking for both data and hardware errors, a spokesman noted.

Subscript optimization has been improved substantially, providing "a major increase in performance," he claimed.

The latest Cobol includes all the standard features of the earlier versions, but also supports American National Standards Institute (Ansi) tape label conventions, the company said.

The merge capability of the sort/merge package will also be available to users of this compiler, the spokesman added.

APL-SF was described by DEC as a "highly extended APL" which supports standard system features and variables and a facility to create local features and variables. The package also backs "extensive" I/O facilities and the ability to set workspace parameters up to a maximum of 512K bytes.

DEC's Conversational Programming Language (CPL) is a high-level interpreter subset of PL/I, DEC said. It supports all four PL/I storage classes, the majority of PL/I built-in functions and pseudo variables, according to the spokesman.

Fixed, float, character, character varying, bit, bit varying and pointer data types, recursive procedures and both stream and record I/O functions are also supported, he noted.

The updated DBMS includes backing for simultaneous updates of the same field by several users as well as all the features in the previous system. A "sorted sets" feature has been introduced to permit efficient organization of data; a data base format increases performance while retaining and improving high reliability, according to DEC.

DEC's Interactive Query Language (IQL) handles retrieval and report-writing chores, working with one or more data bases or conventional sequential files in response to user-initiated requests, the spokesman said.

IQL features are said to include record selection, condition processing, computational operations, total and subtotal accumulations and formatting capabilities for multiple reports.

The spokesman claimed most if not all the software is available now and has been in field test, but he refused to provide pricing information for any of the products, saying it would be against corporate policy to do so.

DEC's large-scale systems headquarters is on Forrest St., Marlboro, Mass. 01752.

Spooler Eases IBM 3/8 Printing

SANTA ANA, Calif. – Spool/8, a printer spooling package for IBM 3/8 users, may increase throughput by as much as 25%, according to its vendor, Business Systems Technology, Inc. (BST).

Described as the first spooler available for the 3/8, the software was developed by BST on a 3/10 – in that environment, it is called Spool/10 [CW, Mar. 1] – and requires use of the 3/10 control software from IBM as well as a BST printer on the 3/8.

(As a by-product of installing the 3/10 control software, BST found 3/8 users also gain support for various disk systems not available to them with the software IBM usually provides for the 3/8.)

Spool/8 enhances system operations by transferring output for the printer to intermediate disk storage; the output can be moved to the printer as that relatively slow device becomes available, a spokesman explained.

Meanwhile, the application program generating the print lines is free to continue at its own speed without having to wait for the printer, he said.

Spool/8 begins print operations before a complete file has been created on disk, making it faster than more conventional "print file" generation and off-line printing, BST said.

Beyond that, Spool/8 allows the user to stop the operation at will, to change the printing sequence of stored output or to produce repeated copies of whatever reports are wanted, the spokesman added.

Although Spool/8 requires BST/750, BST/550 or BST/400 printers and at least 7K of available memory, either BST, IBM or compatible disk drives may be used.

Spool/8 costs $25/mo in sites with BST drives and $75/mo in sites with drives from other sources, the company said from 3015 Daimler St., Santa Ana, Calif. 92705.

Monitor Tracks TSO Usage

ARLINGTON, Va. – TSO/MON, a software package from Morino Associates, quantifies various performance aspects of Time Sharing Option (TSO) usage on large-scale IBM 360/370s, according to a vendor spokesman.

TSO/MON collects performance and utilization information at the system and user level and writes the information on either a System Management Facilities (SMF) or user-defined data set, he said.

The Morino monitor operates continuously and summarizes the data collected on a user-defined recording interval, he added.

In its output, TSO/MON provides information to quantify TSO performance, measure the results of tuning changes, identify TSO problem areas and analyze user problems.

It provides management with data on TSO response time, system load, user access and system availability.

The package requires no modification to the operating system or to TSO, costs $8,900 and is available from Morino Associates, Suite 101, 1401 Wilson Blvd., Arlington, Va. 22209.

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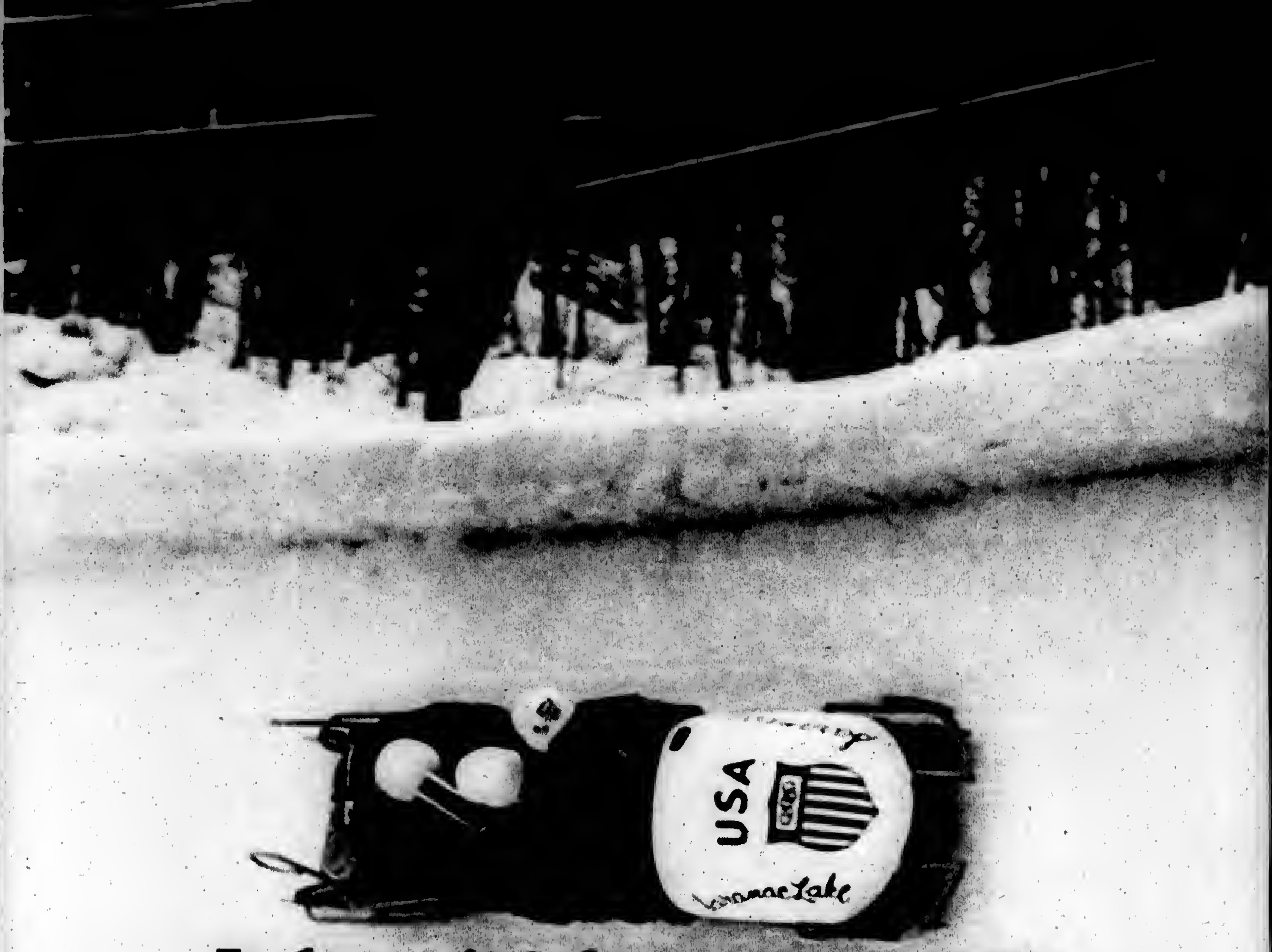

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'TSAS' From ISC

Accounting Package Bills RSTS/E Users

WALTHAM, Mass. – Managers running Digital Equipment Corp. PDP-11s under RSTS/E can bill time-sharing users for system resources – and document both "raw" use and dollar values – with the Timesharing Accounting System (TSAS) from Intelligent Systems Corp. (ISC).

The package can be used in commercial service bureaus or in-house installations which provide service to "customers" within their own organizations.

In the first situation, billings are for actual money owed; in the second, the "billings" might only result in internal transfers, ISC said.

While usage is accumulated continuously, customer invoices or statements can be generated upon demand or on a regular basis, normally at month-end, a spokesman added.

In addition to allocating operating costs to internal timesharing users and providing overhead information to the data center itself, TSAS can also be used to ensure that computer resources are equitably distributed among departments, he said.

Accounts may be classified as billable, development, trial or free; end-of-month reports summarize usage in total and by classification. Beyond that, special rates may be assigned to individual accounts, ISC said.

These might be used in situations in which one-time levels must be exceeded before any billing takes place in order to give new users time to get acquainted with the system or when surcharges must be applied when scarce resources are "overused," the spokesman suggested.

In use at ISC's own installation for more than two years, TSAS is available in source code for $3,500, while binary copies cost $2,500.

ISC is at 460 Totten Pond Road, Waltham, Mass. 02154.

HIS Minis Gain Basic, Cobol

WALTHAM, Mass. – Honeywell Information Systems (HIS) has a Cobol compiler and Basic interpreter for its Series 60 Level 6 minicomputer family.

The Level 6 Cobol compiler is a subset of ANS Cobol-74 and is upward-compatible with HIS' Series 60 Level 66 Cobol, the company claimed.

This compatibility provides a significant tool for applications development for future distributed systems, a spokesman added.

The Cobol compiler also offers file-handling capabilities including OPEN, CLOSE, READ, WRITE, REWRITE and DELETE commands; table handling, subscripting or indexing to three levels; support of a SET statement; and full editing facilities, he said.

Cobol is available for a one-time license fee of $2,750.

The Basic interpreter operates in an interactive conversational environment in which a user can compose, edit, debug and execute programs as well as in a nonconversational "production" mode for program execution.

The one-time license fee to use Basic is $500.

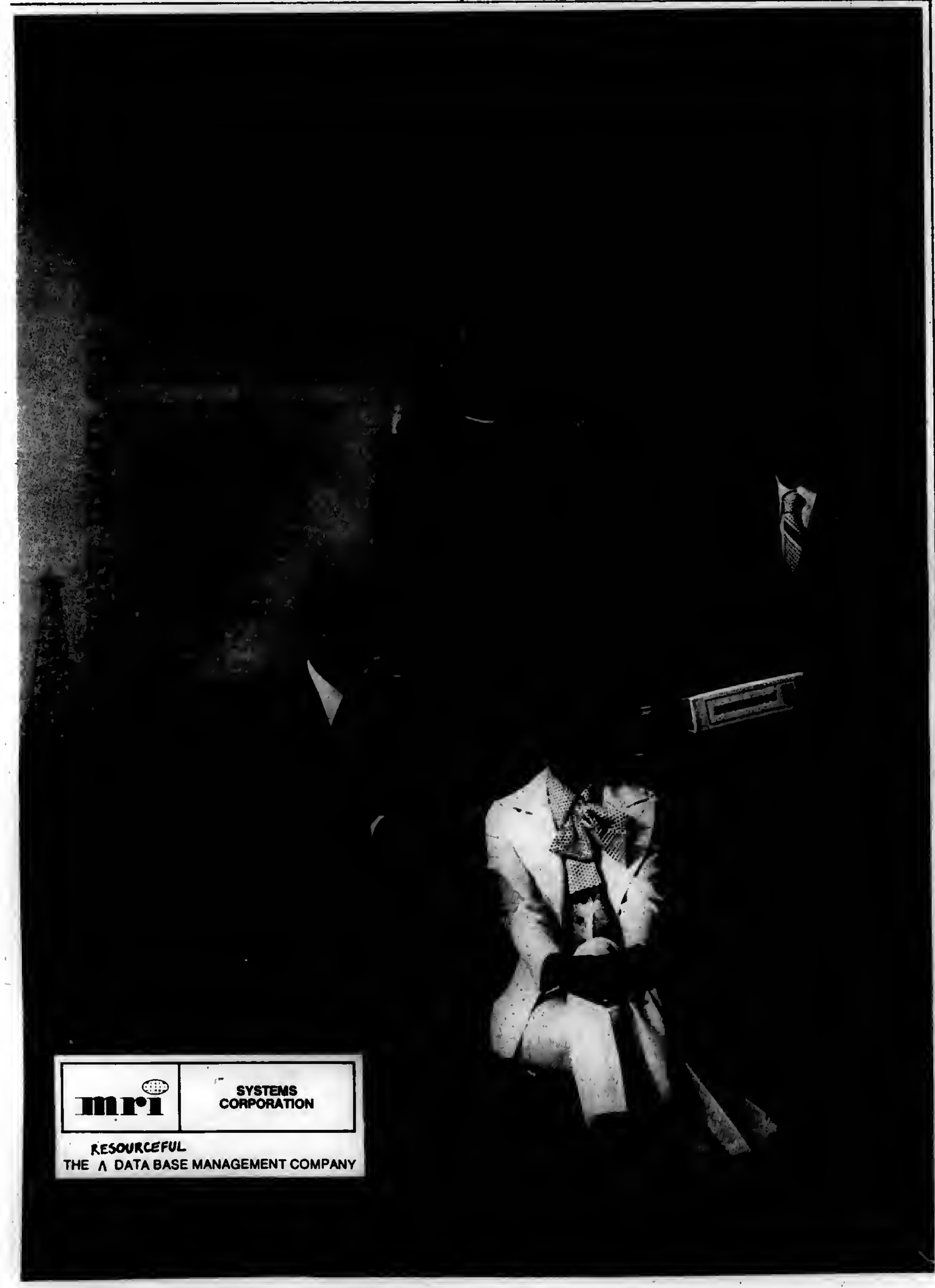
Available now, both Cobol and Basic for Level 6 require 16K words of memory, a disk or dual diskette and teleprinter-compatible console device, HIS said from 200 Smith St., Waltham, Mass. 02154.

Rapidata Cuts Cost Of Storage on Service

FAIRFIELD, N.J. – Rapidata, Inc. has announced a 50% reduction in the cost of storage devoted to data base management systems (DBMS) on its remote computing network.

At the same time, the company is offering a reduction of up to 50% in the cost of all other on-line storage.

Rapidata is headquartered at 20 New Dutch Lane, Fairfield, N.J. 07006.



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The new Integrated Data Dictionary is the only data dictionary fully integrated with any DBMS. As an "active system" it dramatically reduces the amount of manual input required.

Communications Monitor

The SHADOW II teleprocessing monitor has been integrated with IDMS to support high communications environments. SHADOW II is so good that it is already replacing other TP monitors by dramatically reducing storage requirements while improving performance.

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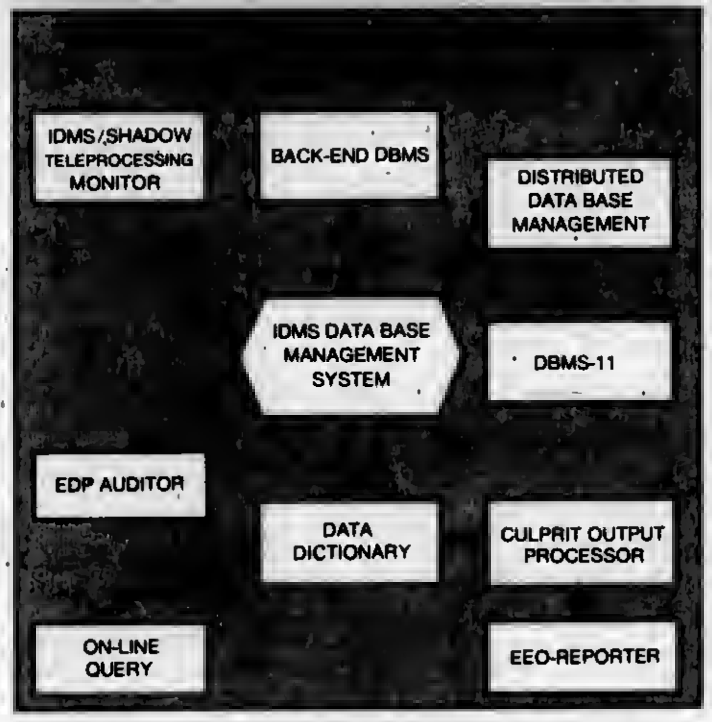
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'Clever Words, Bad Advice'

Glibness Called No Way to Help Novice Tech Writer

By Julia Van Duyn
Special to Computerworld

The greatest disservice an accepted "authority" can do in any field, especially in DP, is to give misleading or false information. Young people entering the DP systems documentation profession – such as the one who wrote to Joe Rigo for "good guidelines on how to document a system" – deserve to get accurate guidelines.

Rigo's response [CW, Sept. 20] might have seemed plausible at first, but it was in fact filled with clever phrases – and bad advice.

For example, he urged the novice to "find out why [user departments] hate the systems staff." During eight years in DP – first as a programmer/technical writer, then as a systems documentation specialist – I have never encountered a user department that hated the systems staff.

It's true that some user departments may be suspicious of the systems development staff at first. Once they realize systems people are trying to make work flow smoother, however, most user departments become cooperative and establish a cordial relationship with the systems staff.

Keep on repeating the above, Mr. Rigo, and you may succeed in ensuring a conflict between user departments and systems people.

No Self-Assignments

Rigo's next step to instant knowledge and $30,000 per year as a systems documentarian was: "Join the team full-time when it is starting to develop requirements for a new system." Rigo should know that in almost any company a young, inexperienced technical writer cannot join a system team when he wants to.

Perhaps in science fiction he could get away with it. However, in the real world, it is the project leader who gives out assignments when undertaking the development of a new or modified system. It is the project leader's responsibility to decide at what stage of the project the DP technical writer/systems documentarian joins the team.

I admit that ideally the documentation person should become one of the team when the system requirements are developed. But what is ideal and what happens in the budget-restricted business world are two different things.

If any inexperienced person is foolish enough to follow Rigo's advice, he will very likely find himself in hot water.

The Human Connection

On to Rigo's next goodie: he just couldn't resist using part of his space to "plug" his Special Interest Committee for Systems Documentation (Sicdoc). How can Rigo claim that joining Sicdoc is one of the keys to bring the beginning documentation person instant success and $30,000/year?

Next in his "six easy steps" Rigo mentioned only IBM's Hierarchy, Plus Input, Processing, Output (Hipo) documentation technique as one of the tools of the trade.

Why should anyone, especially a newcomer to the field, waste hours drawing cumbersome Hipo diagrams when there are many other planning tools – such as Softech's Structured Analysis and Design Technique (SADT) [CW, Oct. 11] – that are easier to draw and maintain?

And finally the piece de resistance: "After you have gone through all these steps, you are ready to tackle your company's documentation problems. You have also become an experienced systems documentarian, and you are ready to move on to a company that pays better. IBM and Digital Equipment will go up to $30,000 for a good writer these days."

Hogwash!

That is the most outrageous misinformation I have seen in print, including the recent election campaign lies. Rigo knows damn well that (with one or two exceptions) systems documentation persons, even real heavies, earn between $14,000 and $20,000 a year – and not $30,000.

The sad part of fiction such as Rigo's is that young people entering the DP documentation field at anywhere from $9,600 to $10,000 may believe it and become dissatisfied, frustrated and even bitter. Of course, during these high unemployment times there are always people waiting for somebody to quit or be fired.

Perhaps Rigo thought he was being humorous. Instead, the resulting article was shockingly flippant and misleading.

Van Duyn is author of the Practical Systems and Procedures Manual *and a lecturer on documentation methods.*

NCI 'Tiger' Eases Coding Task

ATLANTA – The Total Interface Generator (Tiger) package from NCI, Inc., simplifies much of the coding that goes between a user's application program and data bases supported by Cincom Systems, Inc.'s Total data base management system, NCI said.

Tiger is said to generate detailed documentation for each interface function and to offer a way to standardize and control access to the data base.

In effect, the NCI package allows the Total user to include notation of what may be done with the data and by whom in the data base definition, NCI said.

Having established that at the data base end of the interface, Tiger frees the application programmer from coding all the details of what is needed and in what way in his CALLs to the data base, NCI added.

Tailor Tiger

The package also provides "unlimited" user exits at "strategic locations," allowing the programmer to tailor Tiger to meet specific needs, a spokesman noted.

Using these exit points, such operations as data editing, logging, time stamping, statistical accumulations, sign-on protection and the use of the dynamic data dictionary are easy to implement, he claimed.

Written in BAL, Tiger is available for use with Total versions 4 through 7 on IBM 360/370 mainframes operating under DOS, OS or VS. The package costs $3,450, NCI said from 6075 Roswell Road N.E., Atlanta, Ga. 30328.

'ASM-2' Price Break Offered Educators

CUPERTINO, Calif. – Cambridge Systems Group (CSG) is offering educational institutions in the U.S. and Canada a 35% discount on the normal price of its ASM-2 disk management package.

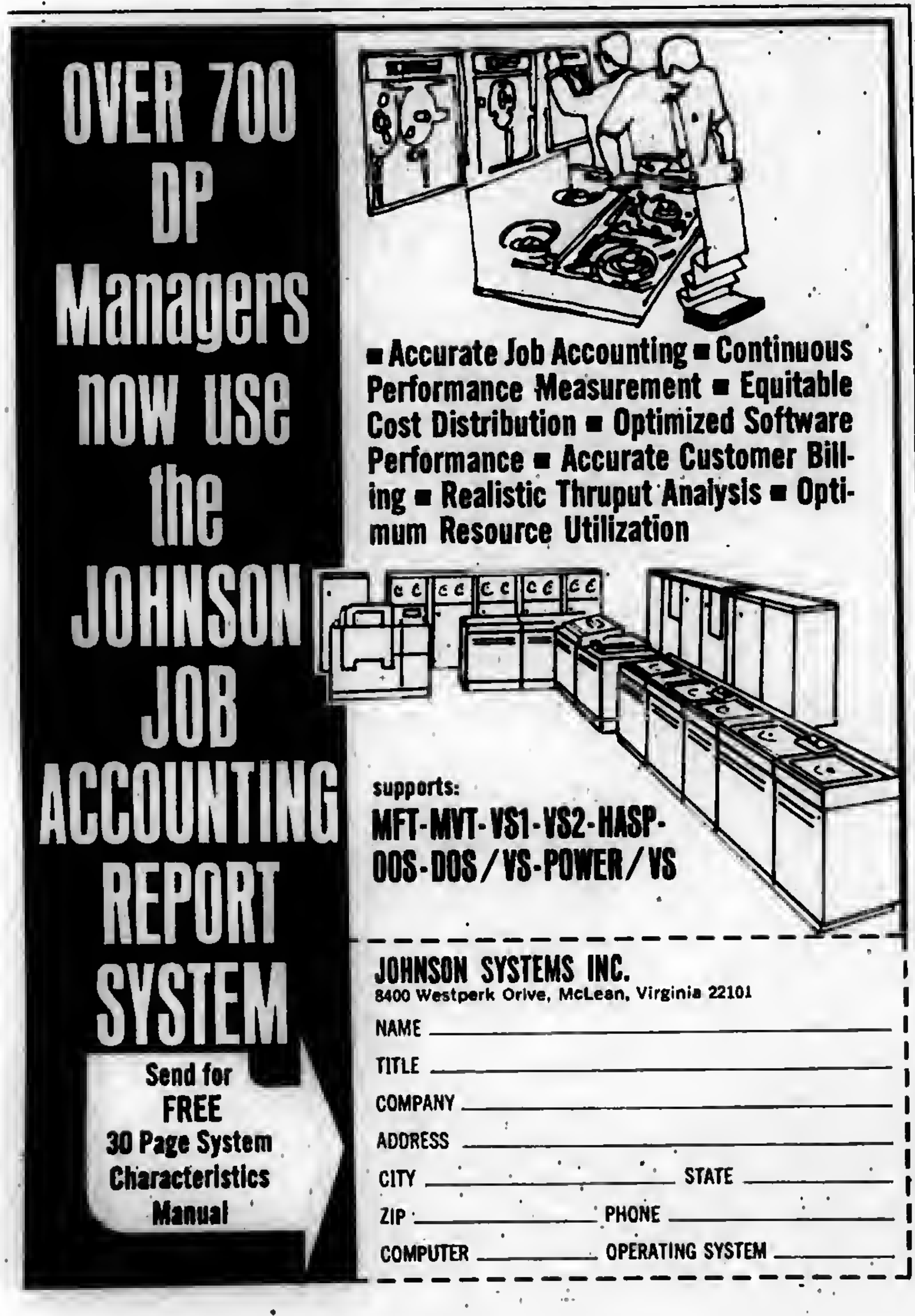
The price break is available only until Jan. 20, the vendor noted.

Designed for use in IBM OS and OS/VS environments, ASM-2 transfers disk files to tape once the files have met specified criteria. The space is then immediately made available for use by the remaining disk files, a spokesman explained.

While used primarily for "archiving" files not active enough to justify being on disk, the package has been used in several installations as a data migration tool, smoothing the transfer of files from IBM 2314 disks, for example, to 3330s, CSG said.

Under the discount plan, ASM-2 is available to educational institutions for $7,500, the vendor noted from 19857 Beekman Place, Cupertino, Calif. 95014.

'Must Have Been Some Sort of Pagan Idol.'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E.A. Strobin, Regional V.P. Mey Dept. Store Co.
S. Choolfaian, Asst. Director of Information Services Lever House
B.D. Waxmen, Director, Div. of Health Care Information Systems, U.S. Dept. of Health, Education and Welfare
J.A. Wood, II, Senior Associate, Richard L. Deal & Associates
H. Frank, President, Network Analysis Corp.
D.I. Knox, Asst. Professor, Adm. Services, Oklahoma State University
R.H. Spicer, II, EFTS Research Asst to V.P., Honolulu Federal Savings & Loan
J.B. Benton, Exec. Director, National Commission Electronic Fund Transfers
W.R. Hinchman, Chief, Common Carrier Bureau, FCC
R. Bennis, Director of Telecommunications, Westinghouse Electric
W.L. Harrison, Asst. V.P. DP Dept, Herlford Insurance Group
W.T. Dixon, Network Design Specialist, GE Credit Corp.
Ire W. Cotton, Computer Specialist, NBS, Institute for Computer Sciences and Technology

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Fraud Prevention Must Be Part of Training Courses

J. Daniel Couger On *Education*

Before I'm besieged with letters about my last column [CW, Oct. 11] I want to print three paragraphs that were omitted. Without those paragraphs, the column invoked reader criticism that was quite valid.

In that column, I referred to the newspaper report (denied by prison officials) which stated prisoners at Leavenworth were involved in a computer fraud. Leavenworth has a rehabilitation program that prepares professional computer programmers.

The paragraph in my column which, without further explanation, caused some justifiable reader concern was:

"Is it a mistake to train convicts to be computer programmers? Is it not tantamount to putting a loaded gun in the hand of a proven lawbreaker? Shouldn't prisoners be trained for less fraud-vulnerable professions – like beekeeping or winemaking?"

My intent was not to berate prison programs, as proven by the following omitted paragraphs:

"On the other hand, which professions are fraudproof? I don't know about beekeeping, but winemaking has its swindles. Most readers will remember the scandal last year when French winemakers were caught watering down their products.

"Nothing in the reports on the French scandal indicated ex-cons were behind the plot. Nor has the fraudulent use of computers in the U.S. corporations been the work of former prisoners – at least, in the publicized cases.

"No – the prison rehabilitation programs would be the paper tiger for a problem which is the fault of computer professionals rather than professional criminals. Our systems are vulnerable – like the hotel signs that urge us not to leave valuables in our rooms to tempt employees."

In *Crime by Computer*, Donn B. Parker described a number of cases of computer crime. He also provided evidence to support my previous conclusion on lack of ex-con participation in computer fraud. For prisoners completing the DP rehabilitation program at Walpole (Mass.), the recidivism rate is only 6% compared with the general rate of 60%. The 6% rate reflects virtually no computer-related crime, according to Parker.

Two issues were identified in my last column. Discussed at that time was the issue of our profession's attitude of implicitly condoning "breaking and entering" of systems. Examples were cited.

This column concentrates on the second issue – the vulnerability of systems to fraud.

Stanford Research Institute (SRI), under the leadership of Parker, has produced some insightful material on fraud. In a recent conversation, Parker said he now has 430 reported cases of computer crime in his file. Computer analysis of those cases will be available by the end of the year.

SRI's Brian Ruder believes wiretapping into terminals is a significant threat. Perhaps you saw a reformed "wiretapper" recently interviewed on the Sunday night television show "60 Minutes." He demonstrated how he could penetrate a "foreign" system with a portable terminal.

By 1980, computer-related frauds are estimated to be 50,000 incidents per year, resulting in annual losses of over $50 million, according to a study by the Institute for the Future.

Widespread Detection

Last year, in an article in *Harvard Business Review*, Prof. Brandt Allen showed computer-related fraud is not confined to financial institutions. He gave examples of detected fraud in manufacturing companies, wholesalers, utilities, chemical processors, railroads, mail order houses, department stores, hospitals and government agencies.

A more complete reference is the *Users Guide to Computer Crime* (S.W. Leibholz and L.D. Wilson, Chilton Book Co., Radnor, Pa. 19087). Part I covers the problems, e.g., "How to Tap, Bug and Spoof a System"; Part II covers solutions.

Computer science programs and company training programs need to expand the curriculum to include the study of fraud-preventive measures – for hardware, software and data-handling procedures.

At present the literature is sparse in this area; most of what is available covers installation security rather than system security.

To begin acquiring the proper background, write to Parker for the six SRI reports on "Computer Abuse and Legal Issues Concerning Computer Abuse." SRI is at 333 Ravenswood Ave., Menlo Park, Calif. The price is $30.

The following additional references are suggested as an initial set of materials for the company or the college library:

- *Data Processing Digest*, 6820 LaTijera Blvd., Los Angeles, Calif. 90045. Each monthly issue contains a section entitled "Security and Privacy" and abstracts several recent publications on that subject area.
- *Guidelines for Computer Security*, published by the National Bureau of Standards, Fips PUB 41, Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 (70 cents). Order SD Catalog No. C13.52:41. Three categories of technical safeguards are covered: physical security procedures, information management practices and computer/network security controls.
- "Privacy and Security in Computer Systems," Rein Turn and W.H. Ware, The Rand Corp., *American Scientist*, March-April 1975, pp. 196-203. (The magazine has offices at 345 Whitney Ave., New Haven, Conn. 06511.) This article describes defensive design, e.g., concentration of software-implemented security functions into security kernels.
- *Privacy, Security and the Information Processing Industry*, Ombudsman Committee on Privacy, Los Angeles Chapter, Association for Computing Machinery, 1133 Ave. of the Americas, New York, N.Y. 10036. The book covers vulnerability in computer systems, a security program and legal considerations of privacy.

Couger is professor of computer and management science at the University of Colorado.

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Data Briefs

Micronet Lets Typewriters Send, Receive Messages

PORTLAND, Ore. – Sidereal Corp. has a microprocessor-based communications system designed to streamline corporate communications departments.

The Micronet II is a small box which attaches to a Sidereal or other typewriter and acts as an editing device; it also provides the capability to send and receive unattended messages, according to a spokesman.

The system has semiconductor memory capacities of 12K to 32K to allow editing and number dialing and redialing; it permits multiple addressing, automatic answerback and verification, among other functions, he said.

Micronet II attaches to Telex, TWX or dial-up lines, has built-in modem and RS-232 or current-loop interfaces and allows communications at all speeds between 50- and 1,200 bit/sec, according to the spokesman.

A Micronet II with 12K of user-programmable memory for formatting features costs $7,800, while the 32K version is priced at $9,300, he added from P.O. Box 1042, Portland, Ore. 97207.

Tektronix Initiates Modem Line

BEAVERTON, Ore. – Tektronix, Inc. has initiated a line of modems with the introduction of the Model 4931.

The 4931 is a stand-alone device, although Tektronix is offering it as an option to its 4010 terminal family. No special housing or outside power source is required with these terminals, a spokesman noted.

Three communications options are available with the 4931: 300 bit/sec for full-duplex systems; 1,200 bit/sec for half-duplex systems; and 1,200 bit/sec with a 5 bit/sec reverse channel for half-duplex systems, according to the firm.

All of the 4931 modems are said to be compatible with Bell System data sets used at the computer end of the communications line. The modems will operate on unconditioned telephone lines with a Bell Data Access Arrangement (DAA) or its equivalent, the spokesman added.

Prices for the modems range from $350 to $800. Tektronix can be reached at P.O. Box 500, Beaverton, Ore. 97077.

Allows Tailoring by User

Univac DCA Works With Variety of Nets

By Ronald A. Frank
Of the CW Staff

BLUE BELL, Pa. – As part of its recent hardware introductions, Univac unveiled a communications architecture designed to be compatible with a variety of network configurations.

With the Distributed Communications Architecture (DCA), Univac recognized the varying network protocols evolving before standards groups and planned user compatibility. Under DCA, a network will operate under Synchronous Data Link Control (SDLC), Advanced Data Communications Control Procedure (ADCCP) or Higher Level Data Link Control (HDLC), a Univac spokesman said.

Thus, the Univac designation of Universal Data Link Control means a user can tailor a DCA implementation according to the data link control being used in his network, a spokesman said.

The initial implementation of DCA includes a Distributed Communications Processor (DCP) which can operate as a front end to a Univac Series 1100 CPU, as a remote concentrator to Series 1100 or Series 90 CPUs or as a nodal processor.

Part of Telcon System

The DCP operates as part of a Telcon "intelligent communications system" that includes Telcon software which performs network control functions, line control and routing functions.

The Telcon network control software modules include internetwork control communications, accounting, error control, on-line diagnostics, status monitoring, command processing, system synchronization and related functions.

The DCP consists of processor, remote I/O controller (Rioc), diskette, cartridge disk, magnetic tape, Scanner I and II communication controllers and the remote control module.

Memory, which can be expanded in 16K byte increments up to 128K bytes, provides a word length of 16 bits plus parity, and direct memory accessing with a read time of 920 nsec and a write time of 860 nsec, according to the spokesman.

A 16-bit computer with 8-bit addressability, the processor includes storage interface, 32 general and 6 special registers, a read-only memory, an arithmetic section and function control sections. Internal data transfers are communicated by means of a single parallel bus which connects all logical units and the general register.

The diskette, an element of the DCP subsystem, operates with a special processor interface adapter to allow parallel I/O time-sharing with attached peripherals, the spokesman stated.

The Rioc provides 16 parallel I/O channels that may be operated in 8-bit or 16-bit mode; a 32-bit parallel operation is provided via strap selection. The Rioc interfaces an 1100 Series ISI I/O channel, peripheral subsystems or transfers information between Dual Communications Controllers, he said.

Scanner Functions

Line termination and multiplexing functions on the DCP are provided by the scanners. The Scanner I provides up to 32 ports either half duplex or full duplex while the Scanner II can handle up to 128 half-duplex or 64 full-duplex lines, the spokesman explained.

Two Scanner IIs can be attached to a DCP for a total termination capability of 256 half-duplex or 128 full-duplex lines, he added.

A small remote concentrator configuration of the DCP with 32K of storage and the capacity to handle 12 full-duplex lines costs $1,438/mo or $57,000, according to the spokesman. A dual V35 line adapter to handle bit-oriented protocols costs $38/mo or $1,500.

The first DCP systems are scheduled to be delivered in October 1977, he said.

DCA networks handle both Univac and

(Continued on Page 33)

Nine Parameters Recommended For Evaluation of Services

By Ronald A. Frank
Of the CW Staff

GAITHERSBURG, Md. – Users should consider nine performance parameters when evaluating telecommunications services, according to Dana S. Grubb of the Institute for Computer Sciences and Technology at the National Bureau of Standards (NBS).

Speaking at the recent NBS symposium on Computer Networks, Grubb said the parameters were primarily user-oriented and several were interrelated. If users objectively evaluate the parameters they can determine the service with the best overall performance characteristics, he said.

First, the transfer rate indicates the number of information bits transmitted divided by the time required for their transfer and acceptance. The significance of the transfer rate is that often the rate is reduced below the capacity of the line because of header, error-detection code and the time required for retransmission of frames or blocks with errors, according to Grubb.

The solution is not necessarily to increase the transmission rate of the line because this may also increase the amount of errors, he said.

The availability was defined as the time interval during which the telecommunications function is available to perform its assigned function.

Availability will vary according to the type of line. Dial-up users can have trunk busy conditions, private-line users can have circuit failures and packet nets are subject to the effectiveness of flow control procedures, he said.

Definition of Reliability

Reliability was defined as the ability to maintain the operation until the transmission of data has been successfully completed. Reliability is distinct from availability in that it describes the performance of a system after it has accepted traffic for delivery.

If traffic is not accepted, it has poor availability although it may have good reliability, Grubb said. Poor reliability can affect the cost of a service because a high failure rate implies high maintenance costs.

Next, Grubb listed accuracy or the correctness of the data accepted by the receiving terminal. Systems with accuracy problems tend to have reduced transfer rates due to the transmission of undetected errors which then require a retransmission of the information, he said.

Channel establishment time is a parameter limited to dial-up links and covers

(Continued on Page 33)

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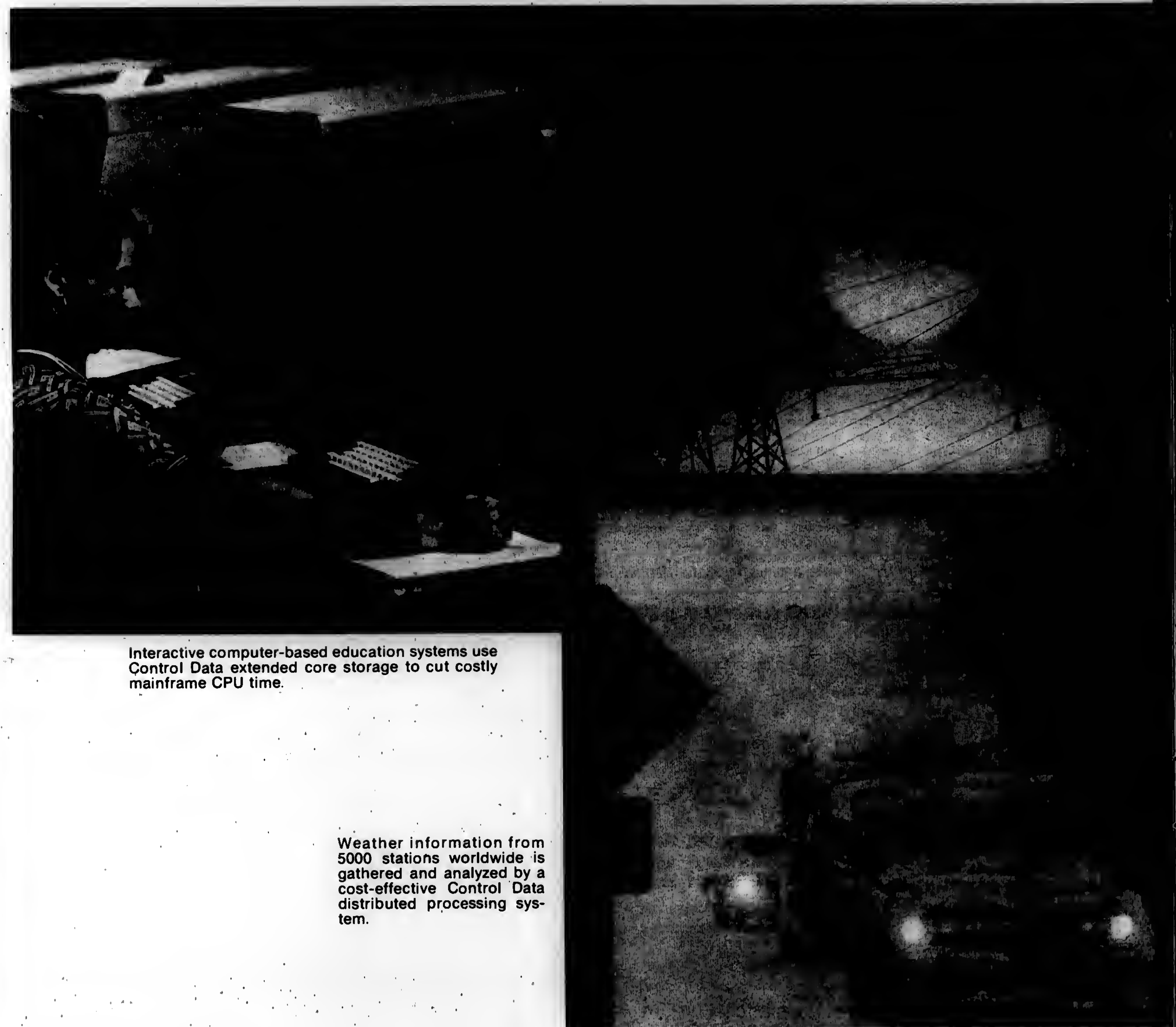

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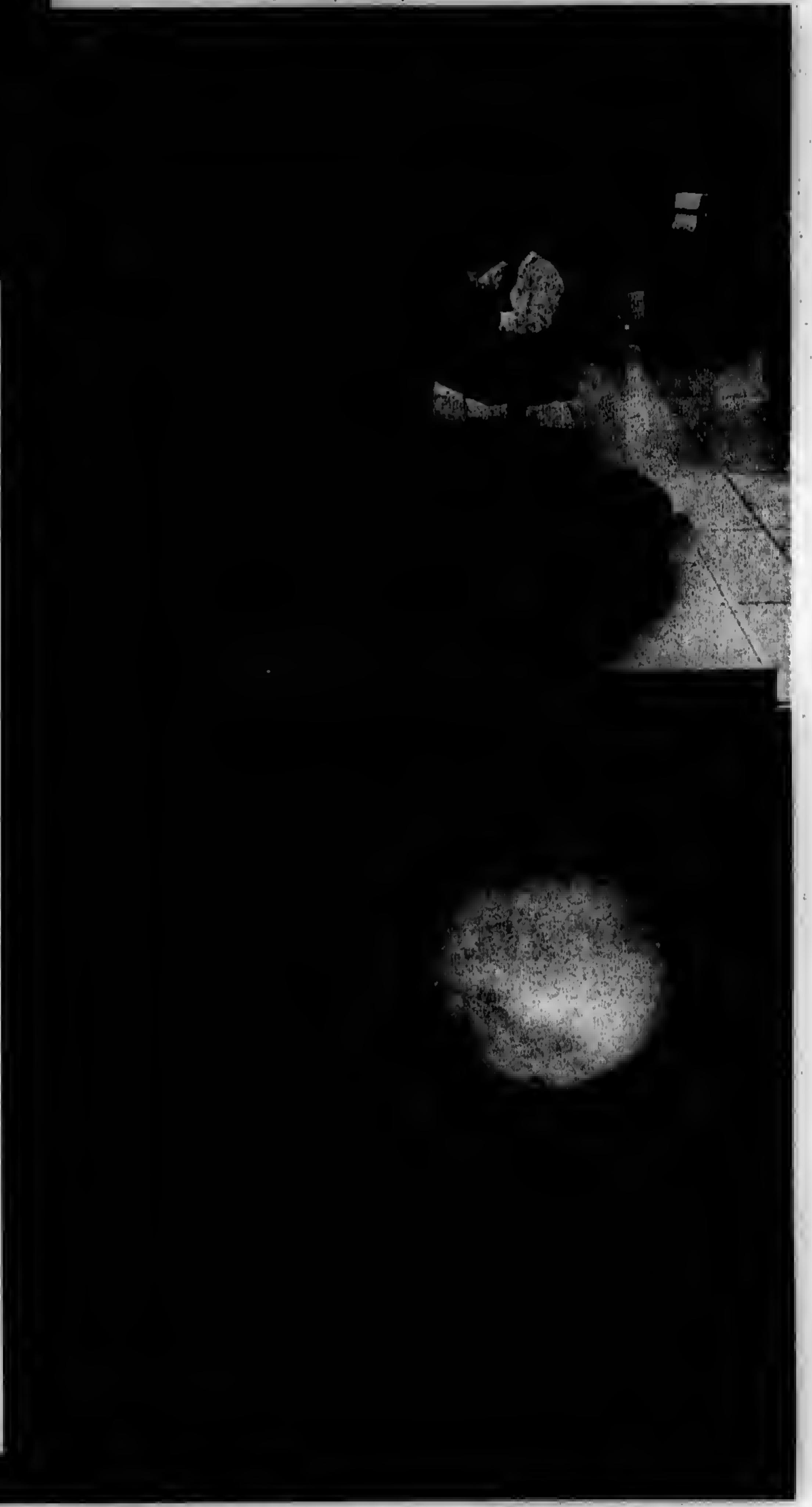

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Nine Parameters Suggested For Evaluation of Services

(Continued from Page 29)

the time required to establish a connection between a calling terminal and a called terminal.

In the case of automatic dialing units, the establishment time does impose a significant delay before the computer can begin its transaction with the remote terminal, he said.

Network Delay Time

Network delay is the time required for data to travel through the network to the receiving terminal or computer. This can be caused by many factors, particularly those at the terminal facility, Grubb explained.

Large network delays can seriously impede information interchange and the system may have to provide buffer storage as a solution, he added.

The line turnaround delay is defined as the time required to reverse the transmission direction of a half-duplex line. It reduces the effective transfer rate and can be corrected with full-duplex facilities, he said.

Transparency was defined as the absence of code or procedural constraints imposed by the telecommunications facility. System changes or user education may be required to compensate for lack of transparency in a network, Grubb said. Because of protocol conventions and other technical considerations, present networks are "quite opaque," he noted.

Security was listed as the last parameter and described as the ability to protect the information being transferred on the network.

The importance of security is dependent on the application. The network is vulnerable to unauthorized disclosure of information being transmitted unless specific security measures are instituted, Grubb explained.

These parameters were described as non-exhaustive, but they were called key factors for users to consider when evaluating a network service.

Grubb's presentation was taken from a paper called the "Criteria for the Evaluation of Data Communications Services" published by Grubb and Ira Cotton in the proceedings of the NBS Computer Network Symposium.

The proceedings are available from the Institute of Electrical and Electronics Engineers, Inc., 345 East 47th St., New York, N.Y.

CCI Has 360/370 Controller

TORRANCE, Calif. – Computer Communications, Inc. (CCI) has introduced a plug-compatible replacement for IBM 270X devices and 370X communications control units operating in emulation mode.

The CC-8 is a communications processing system which operates as a front end to one or more IBM 360/370 mainframes, allowing the CPUs to communicate with remote terminals over a variety of communication lines, CCI said.

Up to 240 lines can be attached to the CC-8, depending upon users' line speed requirements, according to a spokesman. The controller can handle line speeds ranging from 75 bit/sec to 230.4 kbit/sec and can support asynchronous transmission or binary synchronous communications, he said.

CCI product enhancements offered with the CC-8 system include memory utilizing 4K random-access memory (RAM) chips and a line interface base with line sets capable of handling a mix of medium-speed asynchronous and binary synchronous lines up to 9,600 bit/sec, the company said.

The chips are said to offer single- and double-bit error-correction capabilities.

A CC-8 system is upward-compatible and field-upgradable with the firm's higher performance CC-80 communications processor.

The CC-8 costs $39,000 with a "moderate" line configuration and the capability to interface one IBM 360/370; it can be leased for $1,100/mo, including maintenance, CCI said from 2610 Columbia St., Torrance, Calif. 90503.

Digital Data Analyzer Determines Errors

STAMFORD, Conn. – The DMS-303A test set from Dataproducts Corp. is a solid-state digital data analyzer designed to determine error-rate and signal distortion present in communications equipment and systems.

The magnitude of distortion, bit error count, parity error count and loop current is displayed on a front-panel multiscale meter. Parity error detection is shown on a front-panel lamp and the type of distortion is also displayed on front-panel lamps, according to a Dataproducts spokesman.

Sixteen switch-selectable data rates up to 9,600 bit/sec, asynchronous and synchronous operation, a range of interfaces, high-level neutral and polar loop and an electronic Bell System hub are standard features on the analyzer, the company said.

The DMS-303A can be rack-mounted or supplied with a portable carrying case; the carrying case lid contains storage for the power cord, test cables and, if desired, special data terminal and data set interface test adapters.

The DMS-303A is priced at about $1,790, he said from 17 Amelia Place, Stamford, Conn. 06902.

Univac DCA Supports Variety of Networks

(Continued from Page 29)

other vendors' equipment and the user is able to mix character-oriented terminal subsystems with bit-oriented terminal subsystems on different lines in the same network. The DCA concept is designed to retain compatibility with existing equipment, the spokesman noted.

Telcon network software can distribute communications functions among network processors to remove communications overhead from mainframes.

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Terminal Transactions

Reduces Errors in County Reports

Local TV Station Beats Rivals in Election Coverage

By John P. Hebert
Of the CW Staff

KANSAS CITY, Mo. – A local television station remained 35 to 50 minutes ahead of the competition and reduced the percentage of error in reporting county election results with a terminal-based communications system, according to the station's producer of election coverage.

Although American Broadcasting Corp.-affiliate WDAF-TV here has computers for the business side of broadcasting, it employed a separate data communications network with five terminals to better its coverage in the past three primary and general elections, Barry Morris said.

The star of this year's WDAF election night shows was an International Communications Corp. (ICC)/Milgo 40+ Data Display System terminal tied to a United Computing Systems (UCS) time-sharing mainframe across town and low-speed terminals at each of four county election board headquarters, Morris said.

One of the station's cameras was trained on the 40+ CRT screen while an operator seated out of view called up any one of the 75 political races of the election from the terminal's detached keyboard, he said.

Looks Good on Air

WDAF relies on the terminal-based system because it looks good and is faster and more accurate than the archaic, manual tally boards for on-air display that it replaced, Morris explained.

Before the terminals were used, WDAF posted a person at each county election board headquarters to phone updated results to the station newsroom for its two-state, five-county election coverage. With all of the activity concentrated in the newsroom, phone lines were constantly tied up, Morris said, adding additional time was lost conveying and recording the information and relaying it to the TV studio.

After the written information reached the studio from the newsroom, more time was spent making up status cards to manually post on the tally boards, resulting in a time-consuming, error-prone process, he said.

Alternatives Attempted

Over the past four years, UCS engineers and WDAF producers tried different terminal alternatives. In 1972, the terminal used displayed numbers too small, Morris said.

During the 1974 elections, a 30-char./sec terminal built by UCS engineers wasn't fast enough, according to John Burke, UCS senior analyst.

This year, UCS and WDAF employees contemplated using a Bell Dataspeed 40 terminal for on-the-air display, but the device displayed control characters along with election results, Morris said.

UCS borrowed the 1,200 bit/sec ICC/Milgo 40+ for the August primary and, even though Bell came out with a Dataspeed 40 which didn't display control characters, UCS and WDAF were already familiar with the ICC device, Morris explained.

Television station technical people worked on different ways to make the picture sharper for the November elections and found keying over a color mat with station-switching equipment and utilizing a high-resolution black and white TV camera with a special lens would give clarity and precision to the terminal's dot matrix characters for black and white and color TV viewers, Morris and Burke said.

WDAF cameramen finished shooting the station's regular programs early on election day and went out to the county election board headquarters where they "traded their cameras for terminals" and keyed results into Computer Device, Inc. 30-char./sec portable Teleterms, Burke said.

Two phone lines were installed at the field sites for communications with the UCS computer center and voice communications with both sites, Burke said.

The election results were transmitted over the dial circuits to one of UCS' mainframes, a 262K-word, 60-bit memory Control Data Corp. Cyber 174 with CDC and California Computer Products, Inc. disks with capacities of 6G characters, according to the UCS senior analyst.

The CPU stored the updated results in the CPU's program for accessing by the 40+ at WDAF over the final dial-up link.

There were no major problems with the system operation during the elections, although during the system setup, Bell got the lines crossed and put the telephones into the public address system at one of the county board headquarters, he said.

Viewership Increased

Both Morris and Terry Connelly, WDAF news director, agreed there was a definite increase in viewership on the election nights this year.

Morris said independent surveys were taken on those nights and "we saw we were constantly ahead of the competition, but we don't know exactly how much."

"It's always a rough night to rate," Connelly commented, adding one of the main advantages of the display was to help the image and prestige of the station. "It's better all the way around," he said.

WDAF's audience has increased significantly over the last few years and the terminal must be one of the factors, Connelly surmised.

"The candidates say they watch WDAF because we [give] the best results faster," he added.

"It's a good application of computers for that specific purpose – it's more accurate," Morris noted.

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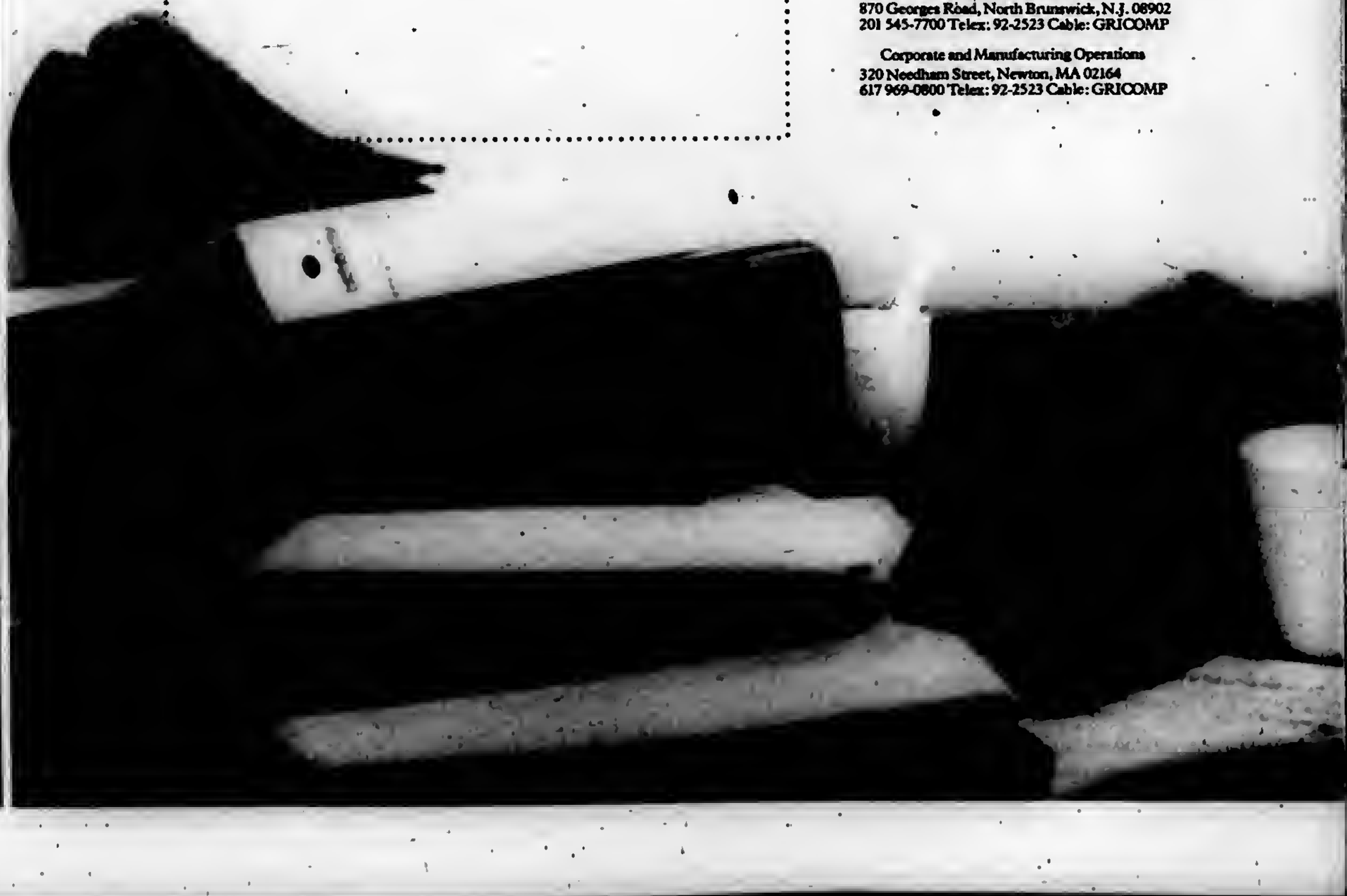


MSI Adds Cassette, Scan Features to Portable Line

COSTA MESA, Calif. – MSI Data Corp. has added the Source 2200 data entry terminal with cassette recorder to its line of portable terminals.

The Source 2200 has an optical wand scanner which can read the MSI Scannable Bar Code and Monarch Marking Systems' Codabar code, according to an MSI spokesman.

The terminal features a 16-character display with the optional capability of "rolling over" to accept entries up to 32 characters long, often required for Codabar applications, he noted.

MSI also has a rechargeable cartridge battery – utilized for the first time by the 2200 – enabling the user to continue gathering data by replacing the low battery with a charged battery cartridge, the spokesman noted.

MSI can retrofit the rechargeable cartridges to existing MSI Source 2100 terminals in the field, it said.

MSI is offering a wider selection of transmission rates for the 2200 than with previous MSI terminals, including 110-, 200-, 300- and 600 bit/sec for teletypewriter-compatible transmissions as well as speeds of 1,200- and 1,350 bit/sec.

Codes include standard 8-bit Ascii and 5-bit binary, according to the firm.

The terminal's keyboard is a 10-key numeric pad with 10 other function and command keys, including conversion symbols as an operator reference in using the Codabar codes, the spokesman noted.

Cassette capacity is about 90K characters on a side or 180K char./cassette rather than the 250K-character capacity of the Source 2100, the spokesman said, adding the 2200's tape moves faster for more accurate data recording.

A standard plug on the back of the terminal accepts a jack from an acoustic coupler, which is available as an optional accessory. Interfaces are available for teletypewriter transmission at 110 bit/sec asynchronous Ascii transmission for an additional cost, he said.

Other features include search and end-of-data modes; a built-in accumulator for tracking the total number of items ordered, monitored or shipped; and a battery indicator to display the amount of charge present in the battery.

The Source 2200 will be available in January and cost between $2,200 and $3,500, MSI said from 340 Fischer Ave., Costa Mesa, Calif. 92627.

CRT Has Two Screen Capacities

TUCSON, Ariz. – The Tele-TEC Model 1445 CRT/keyboard terminal from TEC, Inc. is a teletypewriter replacement that reportedly simplifies conversational interaction.

The terminal provides switch-selectable CRT screen capacities of 1,920 characters in a 24-line by 80-character format or a 960-character format, TEC said.

The Model 1445 also has a detachable keyboard that allows entry of 64 upper-case characters along with top-line entry and automatic rollup. Automatic line feed and carriage return are reportedly switch-selectable and a blinking underline cursor and a variety of cursor controls are standard.

Other standard features include a monitor mode permitting display of control codes, RS-232C, TTL or 20/60 mA current loop interfaces and switch-selectable transmission rates from 75- to 9,600 bit/sec, the company said.

The terminal operates in half- or full-duplex conversational mode, serial asynchronous and Ascii with odd, even or no parity; 10- or 11-bit characters are switch-selectable, it said.

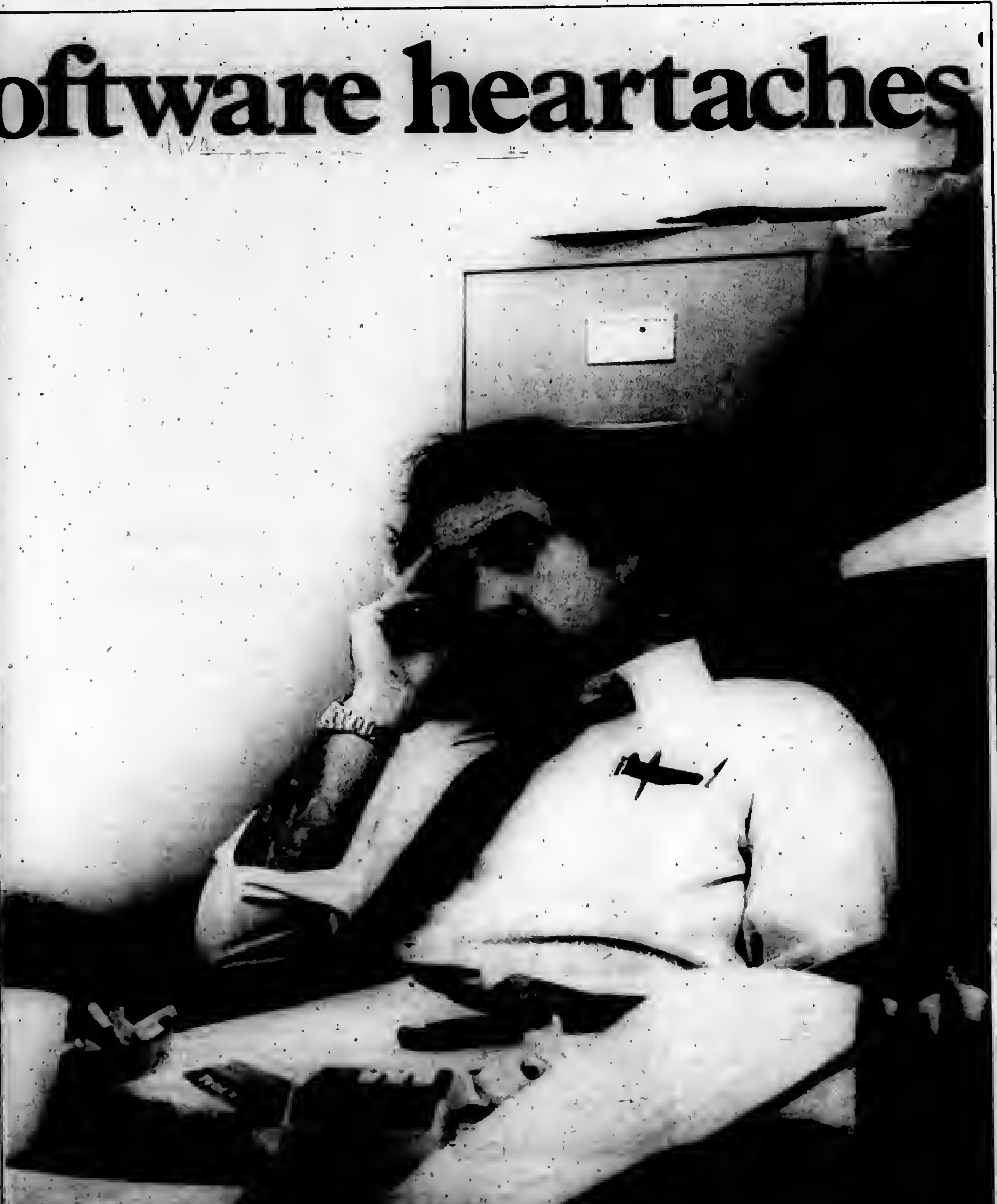
Options include lower-case characters to complete the 128-character Ascii set, rack mounting, auxiliary I/O port for printer or data storage devices and a numeric pad.

Terminal Transactions

A composite video for connection is also available for connection of remote monitors, as is an optional keyboard with single key cursor controls with or without a numeric pad, a TEC spokesman noted.

The Model 1445 can be utilized in single machine dial-up applications or multiple station hard-wired systems, he said.

The teletypewriter replacement costs $1,465 from TEC at 2727 N. Fairview, Tucson, Ariz. 85705.



Wuds Unit Operates On Dial, TWX Nets

MAHWAH, N.J. – Western Union Data Service Co. (Wuds) has introduced a dual-function capability for Teletype Corp. terminals which allows users to perform applications over dial-up telephone lines and also access the TWX teletypewriter network.

The Exchange Data Terminal (EDT) 33 ASR Plus TWX 10 char./sec terminal is equipped as an automatic send/receive configuration providing paper tape operation, according to the company.

Two telephone handsets are utilized – one for voice and data use on the Direct-Distance Dial (DDD) network and the other for the TWX network, a Wuds spokesman noted.

The EDT 33 ASR Plus TWX is intended for businesses needing a dial-up terminal for remote data entry, time-sharing and other data applications, but which also have communications requirements, he said.

When the terminal is switched to the TWX network – by picking up the TWX phone receiver – it can transmit at the 10 char./sec speed to other EDT 33s and 300s equipped for TWX and to other TWX terminals, he explained.

Other features of the terminal include automatic answering, optional speed restraint to communicate with slower international Telex terminals and a single answerback for TWX and DDD use, he said.

EDT 33ASR Plus TWX lease prices begin at $98/mo; the unit can be purchased for $2,290 or $2,307 with the speed restraint feature, the spokesman said.

Wuds is located at 70 McKee Drive, Mahwah, N.J. 07430.

Xerox Software Tops Survey List

Large Mainframe Users Rate DEC Equipment Best

DELRAN, N.J. – Users of Digital Equipment Corp. large-scale systems are more satisfied with their mainframes than users of any other make of general-purpose systems, according to a survey by Datapro Research Corp.

DEC won the accolade for the third year in a row, Datapro said, and placed first in ease of operation, reliability of peripherals, reliability of mainframe (tied with Xerox), ease of programming and conversion and overall satisfaction.

Xerox, despite its withdrawal from the mainframe arena, led the list for its software with a top rating of 3.4 for its compilers and assemblers and 3.7 for its operating systems, the eight-page report said.

The survey covered 1,765 users with a total of 2,095 systems.

Users were asked to rate the systems as excellent, good, fair or poor on 12 aspects of equipment, software and vendor support. A "weighted average" for each category was calculated after assigning a rating of 4 to the excellent ratings, 3 to good, 2 to fair and 1 to poor.

Sample size varied from the 1,257 IBM users who replied to the six Amdahl users who returned the survey.

In overall user satisfaction DEC rated 3.7, Xerox 3.4, Amdahl 3.2, IBM and Univac 3.1, Burroughs and Control Data Corp. 3.0, Honeywell 2.9 and NCR 2.8, the report stated.

	Amdahl	Burroughs	Control Data	Digital Equipment	Honeywell	IBM	NCR	Univac	Xerox
Ease of operation	2*	3*	4	1	6	5*	3*	5*	2*
Reliability of mainframe	5	6	7	1*	4*	2	3	4*	1*
Reliability of peripherals	3	7	6	1	5*	2	4*	6*	4*
Responsiveness of maintenance service	1	7	4	3	6	5*	2	6*	5*
Effectiveness of maintenance service	1	7	4*	3*	6	3*	2	5	4*
Technical support	1	7	3*	2	4	6*	6*	3*	5
Operating systems	6	2*	5*	2*	5*	5*	3	4	1
Compilers and assemblers	6	3	5	2	4*	4*	4*	4*	1
Applications programs	—	4*	1	5	4*	2*	3	2*	6
Ease of programming	3*	2	7*	1	5	6	7*	4	3*
Ease of conversion	2	3*	4*	1	5*	5*	4*	3*	3*
Overall satisfaction	3	5*	5*	1	6	4*	4*	4*	2

*Tie

Copyright Datapro Research Corp.

Manufacturers' Rankings According to Weighted Average User Ratings

Amdahl rated tops in responsiveness of service, effectiveness of maintenance service and technical support; Control Data's applications programs were rated highest by the users.

IBM systems composed 69% of the total systems represented in the survey, Datapro noted, and so in order to see how non-IBM systems rated against IBM units, a set of weighted responses was calculated. "Non-IBM systems were collectively rated higher than IBM systems in the following seven categories: ease of operation, responsiveness of maintenance service, technical support, operating systems, compilers and assemblers, ease of programming and ease of conversion," the report stated.

Most of the users surveyed were running business DP applications on their systems, with data communication ranking second and data base management ranking third. Control Data and DEC users were using their mainframes primarily in the scientific and engineering areas, the report noted.

Use of software was also evaluated in the report. While most users had in-house programming staffs, most also relied on outside packages for assistance.

Respondents used alternative sources for peripherals as well, the report indicated. "Responses in the 'other devices' category included printers, graphic plotters, Micr devices and various types of remote terminals and front-end communications processors." The use of independent peripherals was most common among IBM users, it added.

The report, "User Ratings of General Purpose Computer Systems," also contains information on users' methods of acquisition, remote terminal usage, principal applications and sources of applications programs. It is available for $12 from Datapro at 1805 Underwood Blvd., 08075.

For High-Volume Input

Burroughs Expands AE Data Preparation Series

DETROIT – Burroughs Corp. has announced an additional series of audit entry data preparation systems called the AE 400 and three more models in its AE 500 series.

The AE systems were designed for users who prepare large volumes of computer input data, according to a spokesman. They edit, validate and capture ready-to-process data on the firm's "super minidisks," industry-compatible minidisks or magnetic tape cassettes, the company said.

Editing Capabilities

Editing capabilities include range checking, check-digit verification and arithmetic proofing.

Data prepared on the AE systems can be input to both Burroughs and other manufacturers' mainframes, the spokesman added. Data can be directly transmitted over communications lines, he noted, with errors detected and corrected at the point of entry.

The Audit Entry Language used by the system is said to provide users with a means of formatting programs based on the nature of the data entered into the system.

The AE 412 includes a standard alphanumeric keyboard, separate 10-key pad, function keys, 16 program select keys, a 60 char./sec matrix printer, 240-character self-scan visual display panel and a 243K-byte minidisk.

The system simultaneously prints an audit journal to assist the operator and permit subsequent auditing, the firm said.

The AE 422 is a nonprinting version of the 412.

The AE 511 has the same physical characteristics as the AE 412, Burroughs said, except it includes a magnetic tape cassette.

Super Minidisk Drive

The AE 513 includes a Burroughs super minidisk drive with 1M bytes of storage capacity.

The AE 422 costs $7,150 for the basic system and leases for $264/mo; the AE 412 costs $9,150 and leases for $335/mo. The AE 511 costs $10,450 or $415/mo to lease, while the AE 513 costs $10,250 or $410/mo.

Univac New Year's Resolution: Hike Upkeep Prices 5% to 15%

BLUE BELL, Pa. – Univac has increased maintenance prices 5% to 15% on selected equipment effective Jan. 1.

Maintenance prices have been decreased for other more active equipment, a spokesman noted.

The only "active" products caught in the maintenance price increase are the 1900 Computer-Assisted Data Entry (Cade) system and the Univac 1106 "for which some orders are still being taken," he said.

Decreased in price were the Univac 1100/10 and 1100/20 systems and the 8433 disk drive used with the 90/60, 90/70, 90/80 and 1100 series systems. The 10% decrease in cost affects both CPU and memory, Univac said.

"Nonactive" products affected by the increased prices include the 1108, 494, 418 II, 418 III, 9400, 9480, 9300 and 9200 computer systems.

Maintenance for the 1106 CPU has been increased in price by 13% while the memory maintenance has been increased 12%.

The Cade 1900 system's maintenance has been increased by 15%.

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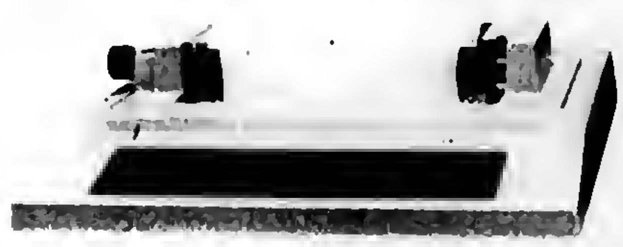

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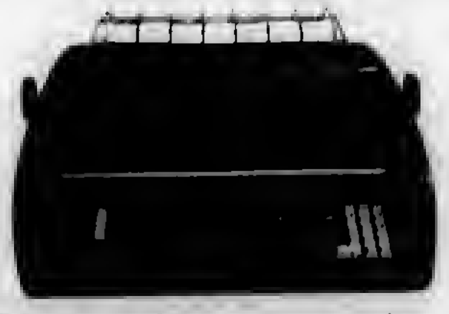

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Control System Cuts Downtime, Inventory Costs

By Joseph R. Giles

Special to Computerworld

LAUREL, Miss. – Within the last year, the average downtime of Masonite Corp.'s primary production machines here has improved, while maintenance costs have declined – despite the addition of a new hardboard production machine and two more coating plants.

Further, since November 1974, stores inventory has been reduced by about $30,000 a month. The cuts in obsolete and excess inventory should continue for at least another year, for a total reduction of well over $500,000 – despite continuing plant expansions and the installation of new equipment, which require an increased variety of parts stocked.

Naturally, many factors contributed to these improved operating efficiencies. But one that continues to play a role is a new maintenance and storeroom inventory control system that works in conjunction with an IBM 370/135.

Designed with the help of maintenance department personnel, this on-line system stores current and interrelated data and provides information – via CRT terminals and periodic printed reports – that enables us to maintain control over labor and material costs, manage stores movement and achieve improved departmental efficiency.

This "handle" on the entire maintenance operation was not possible using manual administrative procedures because of the size of the Laurel plant, the number of people and the quantities of machines and material involved. Our facility has nearly 50 acres under roof and employs almost 2,000 workers to produce well over a billion square feet of Masonite brand hardboard a year for use in interior paneling, exterior siding and industrial applications.

The Laurel maintenance department includes 375 hourly employees and 35 supervisory persons who are responsible for seven major board production machines, four coating plants and finishing and refinishing departments. Despite the size and complexity of the maintenance effort, the on-line system enables us to track almost every activity and analyze costs soon enough to take corrective action.

For example, there are IBM 3270 display terminals installed in the maintenance planning office, main storeroom, garage storeroom and receiving department. If the manager of maintenance and engineering wants to know, for instance, how much was spent maintaining three presses in a particular unit, he can determine through a terminal the maintenance costs for any month within the last year or for the entire year. This type of data is also available in periodic reports produced by the system.

Similarly, the system can provide data on the working hours per crew, performance on each job and overall performance.

In addition, other information supplied by the system can help supervisory personnel plan more efficiently and order the exact parts required for various maintenance jobs. Or they can examine reports covering a 12-month cost history on each piece of equipment, including parts usage. This information, supported by work order detail, can be used to justify replacing parts rather than repairing them when they fail.

Job Time Pinpointed

Work orders can be placed in one of several categories including repair, replace, modification, emergency and capital expenditure projects. A weekly printout pinpoints how much time each crew spent on each type of order.

Every Tuesday night the schedulers and planners also can determine the amount of dollars spent on each capital project through the past Sunday. In the past, they had to wait until the end of the month for such information, which was often too late to permit corrective action.

A work order requisition is routed to one of seven planners, who determine – based on data stored in the system – the number of men and length of the time required for a job and the materials needed. The planner also designates which of 21 crews will handle the job.

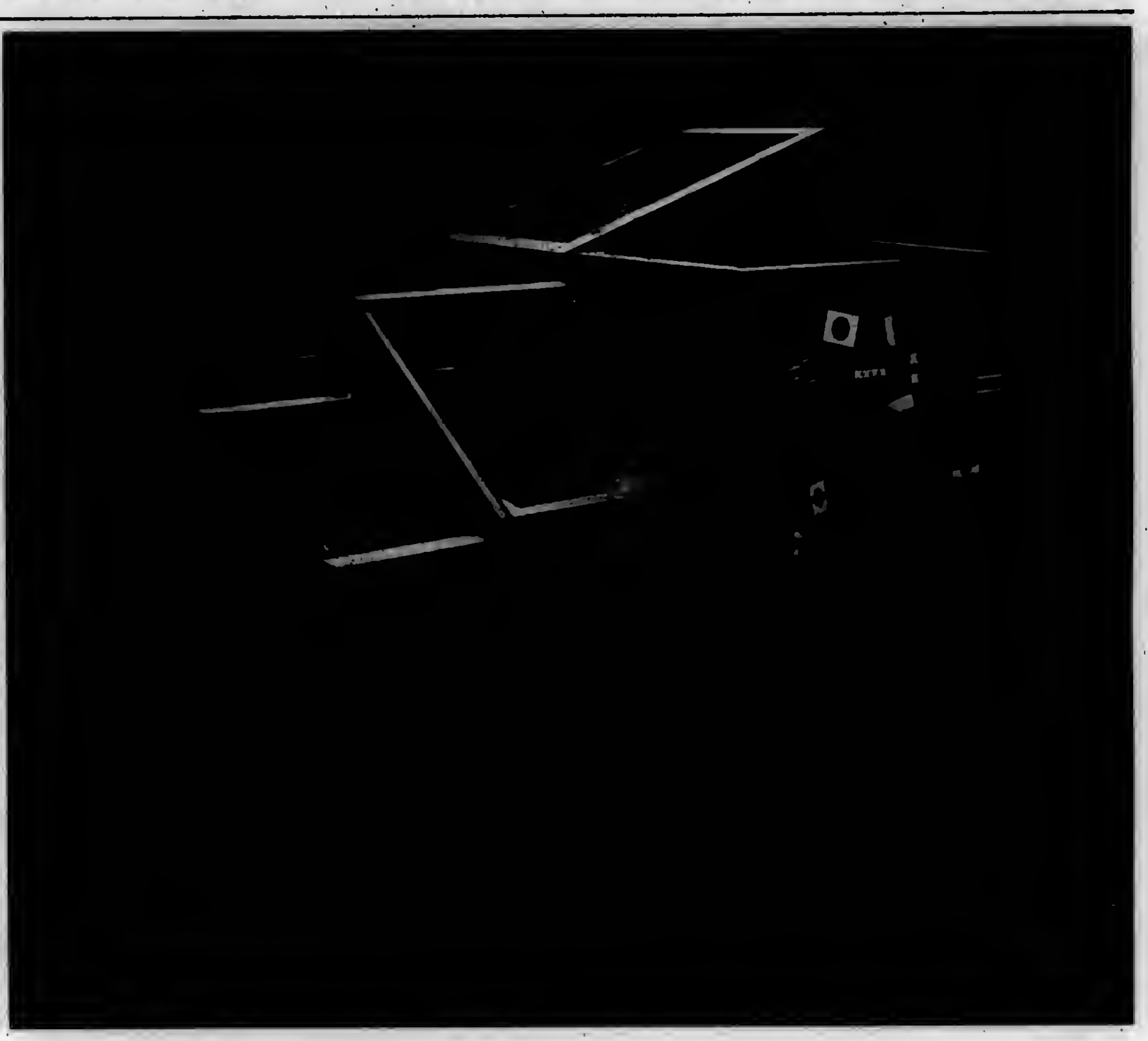
The requisition is then forwarded to a clerk who enters the data into the computer through a terminal in the planning department. The clerk also places a copy of the requisition on the appropriate foreman's board.

Each day, the maintenance scheduler reviews these boards and meets with the foremen at 10 a.m. Schedules for the following day, including new work orders added, go to the foreman by noon each day.

As a result of this system, our maintenance program operates more efficiently, inventories are better and more economically balanced and maintenance costs have been substantially reduced.

But maintenance should never be an end in itself. By far, the most important result of our improved efficiency is the increased uptime of the primary production machines.

Giles is maintenance planning superintendent at Masonite.



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Firm Uses Data Entry to Solve Data Base Problems

SOMERVILLE, N.J. – Using an intelligent key-to-disk system, a pharmaceutical firm here has solved several critical problems relating to the maintenance of data bases on experimental drug compounds.

Researchers in pharmacology, chemistry and toxicology at Hoechst-Roussel Pharmaceutical Co. are using an on-site Datapoint Corp. Diskette 1100 to enter data into a local storage media and subsequently into the company master files maintained on a nearby IBM 370/158.

Transmission from the unit to the IBM system occurs on a disk-to-disk basis via leased line connection. More than 50 researchers regularly use the system for data entry with the help of a specially trained unit operator, the firm stated.

The operator keys in input data which consists primarily of tha results of tests, or "screens," conducted on laboratory animals with new drug compounds.

"The control of research data is important," according to Michael Crocco, scientific systems coordinator for American Hoechst, the firm's parent company. "So much so that source documents cannot be removed from the experimental area, even to a data entry department.

"Hence, the great advantage of the Datapoint unit is the fact it is located in the research department, allowing the scientist to monitor the data to insure complete accuracy," Crocco said.

"The unit allows the bench scientist to have rapid data storage and data retrieval which would not be possible manually," Dr. William Novick, director of pharmacology, noted. "The unique feature of the diskette is that it is located in the laboratory environment and has easy accass as a research tool."

Entry of data into the system is simplifiad by the use of a turnkey system, tailored to meet the particular needs of the research department. The Remote Off-line Data Entry (Rodent) program module allows operation of the various functions programmed into the 1100 with minimal operator interface, Novick said.

Guided by Rodent, tha operator can invoke any subsystem module with "self-help" instructional displays, he added.

During the past year, experimental data maintained on tests conducted in the basic research areas have been undergoing conversion into computer media with the Datapoint unit, ultimately being transmitted to the IBM 370-maintained master file.

"The conversion process is well underway," according to Marion Trost, project programmer /analyst mainly responsible for the system work.

"With our new approach, researchers achieve complete control over the entire body of experimental results generated by a particular Hoechst compound while retaining the confidentiality of their data," she explained.

Daily screening results are transferred directly from laboratory data sheets to temporary storage in the 1100. This information, as well as historic information maintained in the IBM 370/158 is accessible to researchers with a data management package.

"The data entry and editing facilities of the Datapoint combined with ease of communications with the 370 provide us with a truly distributed processing capability without sacrificing security," Dennis Devlin, a Hoechst systems analyst said.

The 1100 system at Hoechst-Roussel consists of a Datapoint 1100 business processor; a full typewriter keyboard; floppy disks, each capable of storing 256,000 characters of information; and a servo printer unit which can be used to print out data files either stored locally on the diskette unit or by transfer from the 370/158 mastar file.

Chrysler 'Doubled Projected Savings' With Installation of 11 COM Systems

SAN FRANCISCO – With the recent installation of 11 computer output microfilm (COM) systems, Chrysler Corp. has "doubled [its] projected savings," according to G.T. Boase, manager of assembly systems.

"If we continue on our present course, we should realize sevings in excess of $1 million annually," Boase told attendees of the annual shareholders meeting of Quantor Corp., whose COM systems are being used by the huge auto manufacturer.

In addition to the 11 systems already installed, Chrysler has a 12th system on order, Boase said.

In an effort to reduce costs, Chrysler undertook an extensive study of its DP activity during 1974-75.

Factors involved in this study were the need to reduce costs, the increased cost of paper, paper coming into short supply and the increased demand for reports, he stated.

"Early in our study, we decided on microfiche over roll-type film because it was best suited to our requirements." In addition, the reduced cost of viewers for microfiche was a major factor in the decision – a comparison of seven to one in favor of microfiche.

Following this decision, Chrysler conducted "an extensive evaluation of available equipment and manufacturers. Our specifications narrowed our evaluation to a possible five producers of microfiche equipment," he said.

Among the criteria the company selected were high-quality microfiche; the one vendor approach for recorder; duplicator and supplies; and competitive cost.

"With this criteria, we installed a microfiche recorder and duplicator for about a year at our Belvidere, Ill., assembly plant," Boase continued.

Chrysler carried out a four-month evaluation of the five selected manufacturers' equipment.

The evaluation involved visiting 11 user sites; a telephone survey of 23 users completing a 11-point questionnaire; requiring each manufacturer to use its software with Chrysler specifications and data to run benchmarks on typical job applications; actual operation of the equipment by Chrysler personnel; and many meetings and seminars with each of the individual manufacturers.

The equipment is "presently producing at a rate of over six million microfiche pages per week. This is over twice the projection we made during our evaluation," he reported.

Chrysler currently has 781 applications on microfiche with most used on a daily basis.

In addition to the economic benefits, "we heve achieved many other benefits such as reduced computer output print time, reduced storage requirements, and reduced manpower requirements for distribution, filing and retrieval of data.

"File integrity is better maintained since a page from a report of microfiche file cannot be removed and clarity of all copies has improved. Mailing costs are reduced and disposal costs are reduced from truck loads to cartons," he added.

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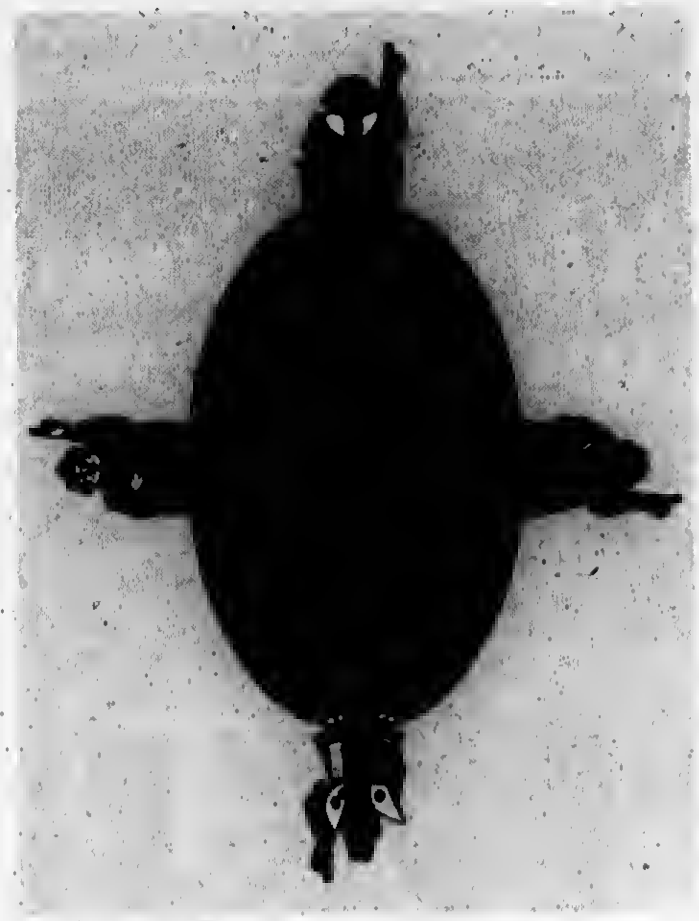

This sequence begins with the replacement of existing IBM 3270 displays, keypunches or remote batch terminals with compatible Four-Phase systems at a few key sites. On these pilot installations, field-proven software speeds the implementation of local transaction processing, local data base management, report generation and communication with the central computer.

Production systems are then installed at the remaining network locations. Because the Four-Phase product line is hierarchical in organization, each distributed processing site can be equipped with a system configured to its precise workload and communications requirements.

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Reconfigured Library Expands Storage Capacity

LOS ANGELES – By reconfiguring its expanding tape library, Western Airlines here has been able to store about 10,000 tapes in an area previously thought "full" with 1,500 tapes, according to Pete Taddeo, Western's director of information services.

The three-shift, 24-hour shop increased efficiency by switching to 6,250 bit/in. tapes, and it improved tape handling accuracy through a color-coded system from Tab Products Co., which includes tape cartridges compatible with self-loading drives and horizontal tape filing racks.

Each self-loading cartridge has its own self-adhesive tape identification number affixed to the circumference of the cartridge, Taddeo explained. This tape identification, utilizing Tab Products' Compucolor labeling system, displays each of up to five digits in a spectrum of colors assigned to digits 0 through 9.

Two hooks are incorporated around the circumference of a cartridge. As a result a reel may be positioned in a rack with the color-coded identification number angled either upward or downward.

The two terminal digits on each Western Airline cartridge are repeated in the identical color code. They are positioned in a built-in label holder in the racks directly above the corresponding cartridge storage. This way, the return of a cartridge to its current position is made visually easier, Taddeo said.

"A misfile under our new system is indeed a rarity. And if one is inadvertently made, the clash of an out-of-phase color makes it easy to locate the misfiled reel," he said. Formerly if a tape was missing an audit usually resulted. That required up to nine hours of tedious checking of tape identification numbers against a library printout.

Western's central computing facility uses 24 IBM 3420-type tape drives, shareable among two IBM 360/65s and a 370/158. Approximately 1,200 tape mountings are made daily. Since the Tab Products cartridges are self-loading, tape mountings require about 50 seconds less than formerly when reels had to be removed from cannisters and tapes manually threaded into drives, he said.

Without the necessity of removing tapes from cannisters, operators can carry up to six cartridges at once. Thus they can mount them on various drives as they are decreed available for new tapes by the system's console. As a result approximately 10 hours of operator time is saved daily.

Savings in tape handling time is not confined to computer operations. With the cartridges, Western finds it saves approximately 15 seconds per reel change in librarian time. The result is another five hours saved daily.

In addition, with the self-loading cartridges, tape is not exposed to airborne contaminants. The tape is exposed only behind the sealed window of a drive, which is filtered continuously and cleaned in accordance with a preventive maintenance schedule, he noted.

Also, the chance of inadvertently dragging a leading edge on the floor upon mounting is precluded, so the chance of data dropout or fouling a drive's read/write head and the propagation of errors on successive tapes is reduced, he said.

Since the circumference of a reel's flanges fits tightly within circular grooves molded into the cartridge, it is difficult to squeeze the flange accidentally and damage the edge of the tape.

Western also uses an evaluator/cleaner. Whenever an automated tape library monitoring program indicates a tape has been cycled five times, it is run through the evaluator. There it is checked for edge damage, and counts and locations of error-prone bit locations are logged. Upon rewinding the tape is cleaned, he said.

Correction

In "Baking Firm Whips Up Savings With Data Entry System" [CW, Nov. 22], the Univac Cade system at McKee Baking Co. cost $1,306/mo at installation. With the subsequent upgrade it cost $2,109/mo.

Our commitment to the tape drive market can be summed up this way:

We make four basic tape drives. One of them is just the one you want.

Because the options we've engineered for our basic four effectively give you a choice of over 400 configurations.

Speeds from 12.5 to 125 ips. Tension arm or vacuum column. A variety of electronics options. And more.

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AMCOMP Tape Drives. Giving you exactly what you want rather than selling you just what we have.

To find out more about the tape drives, or other products and services we have, please contact your nearest AMCOMP office, or AMCOMP, INC., 686 West Maude Avenue, Sunnyvale, CA 94086, phone (408) 732-7330.

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ADDS announces good news for Burroughs users. (Bad news for Burroughs.)

ADDS new Consul 980B is a highly sophisticated, cost-effective alternative to Burroughs' own TD 700/800 terminal series.

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Sorry, Burroughs, there's more good news for your customers. ADDS standard features include:

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Mini Bits

WE Semiconductor Memory DEC PDP-11 Compatible

HOUSTON – WE Computer Extension Systems has introduced a semiconductor memory system said to be hardware- and software-compatible with all models of the Digital Equipment Corp. PDP-11 minicomputer series.

The system has up to 16K by 16 bits of memory on a single quad board that plugs into one of the DD-11 small peripheral controller slots within the PDP-11 chassis, according to the firm.

Featuring a 4K by 1 NMOS static random access memory, the system needs no refresh circuitry, the firm said. The starting address location of each of the four independent 4K memories on the board can be set with a switch, it added.

A 16K by 16 board costs $1,650, a 12K by 16 board costs $1,050; and a 4K by 16 board costs $750, the firm said from 17311 El Camino Real, Houston, Texas 77058.

UDS Adds Line of Mini Interfaces

PHOENIX – United Data Services Co., Inc. (UDS) has a line of minicomputer interfaces that connect a standard Model 33 or 35 Teletype to the current-loop ports of Digital Equipment Corp., Data General Corp., Digital Computer Controls, Inc. and Hewlett-Packard Co. systems.

Each interface kit contains a tape reader controller, associated Teletype cabling and mounting hardware and a 16-ft signal and control cable with a plug-to-plug teletypewriter-compatible port connector, UDS said.

Kits for the Teletype Model 33 interface costs $75 each while the Teletype Model 35 interface kit costs $87. UDS is at 3024 N. 33rd Drive, Phoenix, Ariz. 85017.

Netcom Unit Designed for LSI/11

MOUNTAIN VIEW, Calif. – The P100 power fail/restart module from Netcom Products, Inc. was designed to be used with the Digital Equipment Corp. LSI-11 system.

The unit provides power status signals to the LSI-11 processor independent of the power supply, the firm said.

Circuits in the P100 continuously monitor ac and dc voltages and initiate processor interrupts to signal changing power conditions, Netcom stated.

The unit allows fault conditions to be detected in advance so the processor can shut down systematically.

The unit plugs directly into the LSI-11 backplane and costs $85 from the company at 566 Ellis Ave., Mountain View, Calif. 94040.

First Users Say

Service Called Key to Series/1 Choice

By Esther Surden
Of the CW Staff

The first users of the IBM Series/1 minicomputer introduced recently [CW, Nov. 22] cited service as their major criterion in choosing the systems.

The minis were installed in two locations before their release to the general public, IBM said.

"The big thing was service," according to Michael Schwarz, vice-president of Quaker City Motor Parts in Middletown, Del. "We have many stores in rural areas and we felt IBM could service them better."

Quaker, which has already begun software development on its one Series/1, has made a commitment to buy 50 systems to be used for accounts receivables and inventory applications in the firm's retail outlets. "We are looking to 100 to 130 units down the road," he added.

During the day the systems will operate independently, Schwarz explained, but at night they will receive up-to-date pricing information from the company's main computer, an IBM 3/15.

Strong IBM Shop

"I guess we are a very strong IBM shop," Schwarz noted. "We looked at other systems including one from Data General Corp., but for the price the Series/1 had the right capabilities and flexibility," he said.

Citibank of New York also said IBM's service and support were instrumental in its selection of the Series/1 for use in a transaction processing environment.

"It looks like it will be quite a cost-effective machine," Barry Young, head of the accounting and information services division of the bank's operating group, said.

The bank, which has a corporate commitment to decentralize its DP operations, has had two of the Series/1 minicomputers for several weeks and expects to have three more by the end of the year. Citibank expects to use a total of 30 of the systems, Young said.

"Citibank has done a thorough examination of minicomputers," Young noted, and the Series/1 falls "well within the range of the cost-effectiveness of other systems." In addition, IBM's "new RPQ policy," which has assigned a special group within IBM to help users configure systems and put together interfaces for special equipment was another attraction for the bank, he said.

The bank also liked what Young called the Series/1's "powerful instruction set" and the prospect that IBM will be expanding the line significantly in the future, Young said.

Citibank has a "negotiated price" for the Series/1, Young noted, adding he was not at liberty to discuss it.

Micros Seen as No Threat To DP Service Organization

By Esther Surden
Of the CW Staff

SANTA CLARA, Calif. – The DP department as a service organization has little to worry about when it comes to microprocessors, Paul Rosenfeld, Microcomputer Systems Corp.'s software product manager, said here recently.

"To the extent that he is running a service organization, the [DP] manager's users will want to take advantage of his expertise. He'll have an impact even when each department has an interactive system, because there won't be programming experts in each department.

"More programming will be done locally without going to the larger system," Rosenfeld said.

Computer power will be getting cheaper and easier to put in a very small box, he predicted. However, what is run on the central computer and what is run locally depend on the size of the program.

"If you have a large number-crunching program you need a large computer, but if you have a small program that can run overnight there's no reason to bother with the larger system," he added.

Some efficiency in terms of writing software will have to be achieved at the DP department level, he added, in order for the department to minimize the cost of writing code.

"Writing the software is not going to be any different than it is now, but not so much will have to be done in the maintenance area. Programmers will be doing more original things and pay a little more attention to what the costs are and how to make it more efficient," he added.

Transparent Micros

Right now, Rosenfeld said, microprocessors surround the DP manager but are transparent. They are in the system console and many I/O devices.

The manager doesn't have to worry about software for the systems because they are dedicated and supplied by the system maker, he noted.

"I think by the time the micros surface in the DP department, the manager may find the software tools are there and not so different as with the large CPU. The development process is much the same," he asserted.

Right now most of the processors are hidden and there aren't many user programmable systems available. Because the microcomputer comes from the semiconductor manufacturer and the minicomputer makers were already in the computer business, microcomputers have farther to go and it is unlikely that micro makers will get into the end user business, Rosenfeld said.

"I'm sure there will be canned software for micros sometime in the future," he added.

CM End-User Business System Intended for First-Time Users

LEBANON, Ohio – Cincinnati Milacron (CM) has an end-user business system intended for first-time users or individual departments of larger businesses.

The System 40, dubbed George, includes the firm's CIP/2200B CPU, four I/O ports for options, a CRT console, a printer controller, a 125 line/min printer, two floppy disk drives, two removable diskettes and a controller for up to four more drives, CM said.

Memory can be expanded to 64K.

System Options

Options for the system include a 300 line/min printer, a total of four additional floppy disk units with 630K bytes each, an 80-column card reader and a larger CRT console.

Included is the CM operating system called Cimos with an RPG compiler. Applications software is separately priced, the company noted.

Applications

Applications available include accounts payable, accounts receivable, general ledger and payroll.

The basic George system costs $16,100 and will be available in January, according to a spokesman for CM's Process Control Division, Department LR, Mason Road and Route 48, Lebanon, Ohio 45036.

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PRIME

Board Lets Users Design Controllers

BERKELEY, Calif. – A programmable interface board which allows the development of peripheral controllers for Data General Corp. (DG) Nova and Eclipse minicomputers is available from Teknekron, Inc.

The Teknekron CPI-660A permits the connection of nonstandard devices to the host computer; it also reduces the processor load of standard peripheral devices, the firm said.

The use of an Intel 8080A microprocessor as the control and arithmetic element permits customization through software, eliminating the necessity for hardware development, a spokesman indicated.

The CPI-660A accepts commands from the Nova or Eclipse and interprets the commands according to a program stored in its local memory.

This program performs the detailed sequencing and data transformations required by the attached peripheral devices, the spokesman explained.

The program can also monitor device status, provide status registers for the host processor, interrupt the host processor with data or status information and perform data channel transfers into and out of the host processor's memory, he added.

The unit costs $5,600. Teknekron is at 2118 Milvia St., Berkeley, Calif. 94704.

Travel Agents Get Turnkey

LEXINGTON, Mass. – A turnkey minicomputer for travel agents has been announced by Raytheon Co.

Designed for airline reservations and routine local office tasks, the Raytrav system allows the travel agent to work with a Passenger Airline Reservation System (Pars), receiving passenger itinerary and accounting data from the air carrier's host, while performing accounting, ticket printing, customer list maintenance, invoicing, sales analysis and accounts receivable and payable, the firm said.

The system will support up to 16 CRTs, each programmed in either the Pars or local mode, two 2.5M-byte disk cartridge drives and two printers.

A basic system based on the firm's PTS-1200 mini, four to six CRTs, 5M bytes of disk and one printer, including software, costs about $2,000/mo.

IPS Formatters Meet IBM, Ansi Standards

HOUSTON – The Model 1700 series IBM-standard and Ansi-standard magnetic tape formatters from Information Products Systems, Inc. (IPS) were designed for minicomputer-related applications.

The units feature external control to allow an external event to be synchronized to the data read/write operation; an interface signal is returned when a tape drive is up to speed and prepared to receive data, IPS noted.

Special circuits eliminate premature terminations when reading long phase-encoded data records, a spokesman added.

The formatters provide industry-compatible interfacing to controllers and tape transports from Bright, Pertec Computer Corp. and Wangco, the firm said, and up to eight dual density tape transports can be supported from one controller.

The Model 1703 dual-density/dual-speed formatter costs $3,150; the 1701 NRZI-only version costs $1,200; and the 1702 PE-only model costs $2,300.

IPS is at 6565 Rookin, Houston, Texas 77074.

DSD Has Diskette For DEC Systems

BERKELEY, Calif. – Data Systems Design, Inc. (DSD) has introduced the DSD 210 diskette memory system for use with the Digital Equipment Corp. PDP-8, PDP-11 and LSI-11.

The system is compatible with the DEC instruction set and the IBM 3740 format, DSD said.

Diskette formatting and write protect are standard, the vendor noted.

An 8-bit bipolar microprocessor controls all data transfers, monitors read/write head positionings and performs data error checks; a self-testing microcode performs verification tasks, according to a spokesman.

To enhance data reliability, the DSD 210 uses a digital phase-lock-loop data separation circuit.

The system with single, double or triple Shugart drives costs $2,795. DSD is at 1122 University Ave., Berkeley, Calif. 94702.

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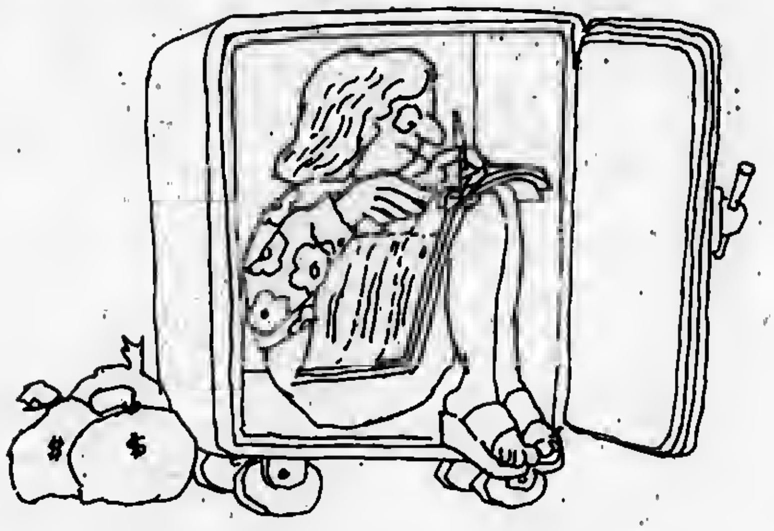
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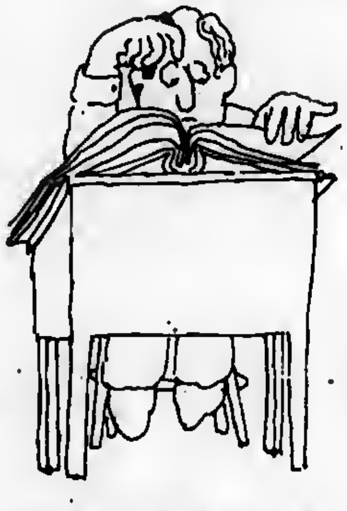
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Users Should Consider Options

David Saw Only Symptoms of Poor Mini Service

By S. Terry Woods

Special to Computerworld

As a representative of a company dedicated to service on minicomputers, I would have to agree for the most part with Jon David's article, "Mini Service Not Too Good" [CW, Oct. 4].

Minicomputer Exchange

Service is the weak link in minicomputers, but turnover, lack of parts and little experience are the symptoms, not the actual problems.

Three types of service are available – manufacturer, third-party maintenance company and independent specialist. Unfortunately the user rarely has a choice. The first two types are the only service available to 90% of the users in the field.

Manufacturers' maintenance is often ineffectual because these companies consider field service an expense to sales. It is only a selling tool; service answers to sales, so it rarely has an opportunity to develop into an efficient, creditable organization.

Field service in this case suffers from a lack of parts because the manufacturer will make money selling those parts in machines, but will make nothing if they are in a spares kit.

Ultimately these conditions breed frustration in service representatives who want to do a good job.

This frustration creates a second problem – high turnover – which in turn creates a third problem – lack of experience.

The second type of maintenance is supported by the manufacturer who does not want to spend money on field service and turns to a third-party maintenance company.

These companies, for the most part, provide the manufacturer with large numbers of strategically placed "warm bodies," while the manufacturer must provide the parts. Users again suffer because manufacturers do not want to take parts from the assembly line.

But there are numerous other problems with the third-party maintenance companies. Since their contracts are normally on a one-year basis, they cannot afford to spend much on training. Service representatives rarely get much experience on any one piece of equipment because the company takes on contracts for everything from typewriters to minicomputers to electric stoves.

This breeds frustration in the conscientious service people, which in turn encourages high turnover.

David has probably not been exposed to the third type of maintenance or he might have a more positive outlook on service.

Readers are urged to reply to this or any other Minicomputer Exchange article.

This is your column, a chance for you to exchange views on the various topics confronting the minicomputer user, a chance to tell the vendors what you are thinking and to let your fellow mini users know about pitfalls or new techniques in this area.

Letters or manuscripts should be addressed to Minicomputer Exchange, Computerworld, 797 Washington St., Newton, Mass. 02160. Double space, please.

When a company specializes in one system it takes full responsibility for all phases of maintenance. It purchases, controls and repairs its own parts, and since the service representatives specialize, they get ample training and experience and become confident of their ability.

This type of company is a service company run by service people. It rarely has a turnover problem because all problems are viewed with service in mind. This allows a person to acquire confidence, build a good reputation and avoid frustration.

Although this type of company appears to be the obvious solution to the maintenance problem, it is not very often available. In order for a company to survive specializing in one system there must be a heavy concentration of that system in a small geographic area. There are so many minicomputer manufacturers entering the field, there is rarely enough equipment concentration to make the investment feasible.

When purchasing a system most users look at software, hardware capabilities and cost. A longer look at available service might create more sophisticated and happier users.

Woods is president of Data Systems Support, Inc., a minicomputer service company in Woodland Hills, Calif.

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IBM User Needing Memory Hike Sidesteps Vendor's Requirement

CINCINNATI – When Whiting Manufacturing here found it needed more core memory on its IBM 3/15B – but not as much as the incremental amount dictated by the system's vendor – it turned to an independent memory manufacturer.

That "unique" combination of memory has since been replaced, according to William Boehm, controller for the manufacturer of comforters, draperies and pillows. While it lasted, however, it worked for the firm, he said.

Memory has since been expanded further because the company implemented additional on-line applications, he explained.

"We were [previously] capable of running one partition at 18K with full spooling support, but our other partition was only at 12K without spooling," Boehm recalled.

"We wanted to use the other partition for spool support and production and estimated we needed another 16K to 80K," he said. "But we couldn't cost-justify 96K and no vendor could supply us with anything but the normal increment until we called on CFI Memories, Inc."

Whiting would support the software side, but was concerned whether CFI would provide the hardware. CFI said it would.

By creating an 80K supervisor, Whiting was able to run all the software, spooling and the IBM utilities it was using. CFI in turn provided the add-on Mosfet memory and the system was expanded from 64K to 80K words of core memory.

"We did the supervisor work through the system console by means of an IBM utility that modifies disk pack data without mandatory regenerating of the system," Boehm said.

The result was a cost savings of about $65 a month. Before the add-on, the system had a 34K supervisor with spooling in only one partition, an 18K application partition and a 12K file maintenance and testing partition without spooling.

With the additional 16K, Whiting can offer 38K of supervisor with a 22K application partition for print and input spooling. There is also another 20K partition for production which is also fully supported for spooling, Boehm said.

Software programs for payroll, invoicing, order entry, sales analysis and production and inventory control were written in-house in RPG-II, with some Assembler subroutines.

"For anyone who is adept at modifying the supervisor, it's a simple change that makes an 80K or 112K machine quite viable," he added.

BST Has 20M Drives For IBM 3/8 Users

SANTA ANA, Calif. – Business Systems Technology, Inc. (BST) has a 20M-byte disk drive for the IBM 3/8.

The plug-compatible, direct-access drive is capable of increasing system capacity by more than eight times over standard IBM capacity, BST claimed.

A maximum of four BST drives can be attached to the 3/8 CPU, a spokesman noted.

The drive's average access time is 35 msec and the data transfer rate is 312 kbyte/sec, he said.

In order to run the larger drives of the 3/8, users must obtain 3/10 operating system software from IBM which does run on the 3/8, BST said. IBM will supply this software to its users, the spokesman added.

The first disk and controller cost $600/mo on a monthly rental plan or $500/mo on a one-year lease, BST said from 3015 Daimler St., Santa Ana, Calif. 92705.

Digitizer, PDP-11 Linked

FAIRFIELD, Conn. – Summagraphics Corp. has an interface to couple its Data Tablet/Digitizer with Digital Equipment Corp.'s PDP-11 minicomputers.

The interface, a single quad-width printed circuit board occupying one slot of the DEC Unibus, transfers X-Y coordinate information from the Summagraphics controller to the CPU and operates in either programmed I/O or interrupt mode, the firm said.

The interface with a 10-ft connecting cable costs $1,350 from Summagraphics at 35 Brentwood Ave., Fairfield, Conn. 06430.

House-Hunting System Saves Realtors' Time, Energy

By Esther Surden
Of the CW Staff

TUCSON, Ariz. – A minicomputer-based house-hunting system here is making life easier for real estate agents in this part of the country, according to Jerry Mitchell, executive director of Mylar Corp.

Mylar uses its Burroughs B1726 mini to provide a special kind of service to area real estate dealers, Mitchell said.

"We commissioned a professor from the University of Arizona to do a physiological profile on different houses. Then a videotape demonstration defines the individual's architectural preference," he said.

"Stacked up against what's available, the real estate broker then knows which properties to show the prospective buyer," he explained.

The brokers have TD 700 terminals in their offices. A 50-question preference test is given to the client and entered into the CRT.

Previously, employees had rated the houses according to the questions, "so all the mini has to do is make a search through the real estate listings to find out what would most suit his client," Mitchell said.

After the system makes its search, the prospective buyer is shown pictures of the selected homes. If the client is interested in any, the agent takes him to visit the site, he explained.

Savings Demonstrated

"We can demonstrate we are about 35% cheaper than most multiple listings and can save the broker about 65% in direct cost overhead," he claimed.

Mylar chose the minicomputer after talking with IBM, who in effect said "come back when you're big enough," Mitchell reported.

The Burroughs personnel became very interested in the firm's ideas and offered help in setting up the programs, he added.

Another reason the firm purchased the Burroughs system was the ability to upgrade from the bottom to the top of the line without reprogramming, Mitchell said.

The primary savings in using the system are a result of fewer wasted house visits; the client is shown only those homes that fit his needs. The system is nonbiased, so buyers won't be "upgraded" to a home that is more expensive than they can afford, Mitchell noted.

The firm sells the service for a one-time charge of $1,000 plus $225/mo and a percentage of the gross income from the system, Mitchell said.

The B1726 with 94K of memory, keypunch, disk and a line printer represents about $500,000 in research and development costs, he added.

Mini Eases Security Firms' Cost Accounting

LOS ALAMITOS, Calif. – Two sister companies here that design, manufacture and install security systems are using a minicomputer to conduct both cost-accounting and research operations in addition to selling time.

Protection Products, Inc., one of the two firms, manufactures and distributes security equipment to the alarm industry. This equipment is primarily designed for systems in homes and stores.

Pro Systems, Inc., the second firm, is a state-licensed contractor of sophisticated security installations for banks, government agencies and public utilities. Both firms share the same management, but operate independently.

A Hewlett-Packard (HP) Model 2000 Access computer was installed by Protection Products to manage inventory, according to John E. Harwick, president.

Perpetual Inventory

"As a wholesale distributor, we have more than 1,000 customers and 1,000 items of inventory. The computer conducts perpetual inventory, automatic invoice typing, payables and receivables," he said.

"Just keeping track of inventory and customers was enough to justify our purchase of a minicomputer. However, we felt that it would be possible to finance a larger computer like the HP 2000 Access by finding time-share customers to use the system," he continued.

"As a result, we had over $1,000 per month in revenues lined up even before the computer arrived – nearly half of the total cost. Since then, we have continued to add customers. We expect, very soon, that all payments for the computer will be made by others while we still retain half of the use."

Systems Experimentation

Pro Systems is now also using the 2000 and is experimenting with new DP-based security systems. To do this, the computer receives a series of inputs simulating the activities of a large building or utility, Harwick said.

Different software is then tested for effectiveness in directing security operations like monitoring alarms and controlling access to doors and vaults, he explained.

"We also expect in the near future to develop a complete computer-based building control system, one that will not only use the security software, but also monitor and control in real-time heating, air conditioning and lighting systems. Our in-house 2000 Access will be used to develop that hardware/software system," he said.

"With the money saved by our time-sharing service, we have been able to afford full-time personnel to develop these systems," he added.

Primary Clients

A large number of Pro Systems customers are colleges and universities. One of the primary reasons for the purchase of an HP computer was that a large number of schools already used HP systems for educational and business uses, according to Harwick.

"Our in-house designed security software will be compatible with their systems. It gives a university the opportunity to make maximum use of its computer's potential because security systems are needed most when the computer is usually used the least," he explained.

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As the once-in-a-lifetime U.S. Bicentennial approaches its demise, it's time to sit back and look beneath the headlines for the truly significant events of 1976. Beyond those tall ships, giant cakes and candidates, what really happened to shape and direct this historic year? If you're involved with computers, you'll find answers that affect you in *Computerworld's* Year-End Review and Forecast, appearing in the special, combined issue of December 27/January 3.

Edited by E. Drake Lundell, this special issue will be filled with useful analysis and insightful commentary on the year's most compelling computer stories. To name just a few items, this report will cover the latest developments in computer hardware, software and communications; the effect that recent (and pending) legal decisions and/or federal policy revisions may have on the industry as a whole; and the way computers are changing our society. In addition, a variety of experts will be on hand to help shake the dust from *Computerworld's* crystal ball, and give you knowledgable forecasts of important events that are likely to occur in 1977. It's all coming your way December 27th -- and if you're involved with computers, you'll find articles, newsnotes, commentary and summary that will interest and inform you.

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Micro System Reduces Supermarket's Electric Bill

MINNEAPOLIS – A microcomputer-based energy management system has already saved a local supermarket here about 17% of its yearly electrical energy costs, according to the user.

The system installed at six Lund, Inc. supermarkets will reap the firm a projected savings of about $15,000/yr, Vice-President Vern Bockman predicted.

The decision to automate was made not only to save energy costs, but to allow the firm central control over the store's vital operations, Bockman said. However, management also wanted to give each of the stores local control, he said.

Other types of systems the firm considered, including an IBM System 7 minicomputer-based unit, would have been too expensive to install on a store-by-store basis and would have been insufficiently flexible if all six of the stores were to be tied together, he explained. So, the company chose an energy control system based on a stand-alone microcomputer, he said.

Based on the Micropac 180 system from Process Computer Systems, the system was developed by the Roy G. Letourneau Co. of Minneapolis.

It controls the operation and maintains the performance efficiency of refrigerators, freezers, the central heater, unit heaters, water heaters, air conditioners, ventilator fans and air curtain doors which control the passage of air of varying temperatures into and out of the 36,000 sq-ft building, he said.

Eventually, the store's lighting system will be brought under control of the system, especially during the summer season, Bockman indicated.

The increased illumination by the sun through the glass storefront permits a reduction in the use of artificial lighting, reducing the amount of heat which the air conditioners would have to expel from the premises, he explained.

Predetermined Power Level

The system hardware controls Lund's supermarket equipment in accordance with a predetermined maximum level of power demand based on the optimum use of the equipment, Bockman said.

Operating via I/O relays, it shuts off equipment during time intervals when their operation is unnecessary. In addition, the devices can be cycled to receive during their operation periods just enough current to enable them to maintain optimum performance levels, he stated.

The system automatically shuts down the air conditioning for the night. If the interior temperature of the store rises to 90°F during the night, the function override, sensing the thermostat has closed, will turn the air conditioning back on until the thermostat has reopened, Bockman explained.

Without this feature, the air conditioning would have to be left on throughout the night on the off-chance the temperature would reach an unacceptable level. The consequent wastage of power would be considerable, he noted.

During the cold season, the system automatically turns off Lund's central heating for the night. However, the user has set 55°F as his minimum acceptable overnight temperature.

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Minicomputer Helps Alleviate Small Hospital's Growing Pains

BENTON, Ariz. – A minicomputer at Saline Memorial Hospital here is helping soothe growing pains prompted by the expansion of inpatient capacity by nearly 50%.

Saline Memorial is a 92-bed general-care facility with a staff of 16 physicians and surgeons and about 300 employees. A 44-bed extension is now nearing completion.

"We had our troubles little more than a year ago," according to E.F. Black Jr., assistant administrator of the hospital. "A ledger card posting system for patient records was increasingly inadequate in the face of rising patient and service volumes.

"We were having difficulty with tracking and applying ancillary patient service charges and keeping up with our receivables position and payables commitment; welfare and Medicare recordkeeping requirements were exploding," Black said.

"We also had no way to obtain the current, pertinent information needed for effective financial control and planning," he added.

Swift, Painless Conversion

Saline Memorial installed its first computer, an IBM System 32, in July 1975. Conversion from the old manual system was swift and painless, according to Peggy Hayre, manager of data processing.

To date, four of the five application programs included in the Hospital Financial Management System package have been implemented: These are patient billing, accounts receivable, accounts payable and general ledger.

The fifth application, payroll, is expected to be on the computer system soon, she said.

"The system automates the patient record and billing functions, cuts the paperwork load down to size and enables us to keep a tight rein on our receivables and payables situation," according to Black.

"The Hospital Financial Management Industry Application Program [IAP] pulls together and makes readily available information that is invaluable to our management. As a bonus, the system saves time and money in routine business operations," he said.

"The IAP performs all of the functions and provides the reports and management information a small hospital needs, and we felt we would be foolish not to take advantage of this," Hayre said.

"So far, the benefits to operations and management are impressive, with the major advantages, in my view, being derived from the patient billing and accounts receivable applications," she commented.

The patient billing system at Saline Memorial creates and maintains the patient record, applies room charges and triggers production of inpatient and outpatient transaction documents, admissions, discharges and transfers lists.

A daily census report by physician and within nursing stations is also prepared.

Ancillary service charges to the patient are collected with an IBM 5230 data collection system which serves the pharmacy, laboratory, radiology, respiratory therapy, surgery and central supply departments, Hayre explained.

"Patient billings produced on the computer now go out faster, thus speeding up our cash flow and reducing our clerical costs," Hayre said. "And the administrator and the controller get detail and summary reports on the number of services performed in each ancillary department, as well as the total charges.

"These are extremely helpful in analyzing service usage patterns and trends, establishing pricing levels and reviewing revenue sources," she noted.

The accounts receivable system maintains account records and furnishes automatic aging reports on a weekly basis.

Collection letters with appropriate overdue notices (30-, 60-, 90- and 120-day) are printed. Revenue reports and breakdowns of dollar amounts by department and classification (Medicare, Medicaid, welfare) within department are now available, Hayre stated.

Pertec Offering Formatted Drives

CHATSWORTH, Calif. – A series of OEM-formatted minicomputer tape drives incorporating a microformatter that eliminates separate interface hardware is available from Pertec Computer Corp.

The microformatter, using LSI/MSI and low-power Schottky TLL electronic components, offers both NRZI and phase-encoded tape formats on a single circuit board, according to the firm.

The drives include file search capability, space record commands and a crystal oscillator for timing. Up to three drives can be added in a master-slave configuration, Pertec said.

The drives are available as the models FT7000, FT8000 and FT9000. An internal circuit board eliminates the need for a separate formatter box and associated cabling usually required to interface a tape drive with a computer system.

The unit also eliminates the need for a separate formatter power supply by using the same supply as the tape transport, Pertec claimed.

The drives are available in 12.5- and 75 in./sec versions and 1,600- or 800 bit/in. storage density. Speed is switch-selectable, the firm said.

The formatted tape drives in read/write versions cost $3,275 for the FT7000, $4,195 for the FT8000 and $4,700 for the FT9000, Pertec said from 9600 Irondale Ave., Chatsworth, Calif. 91311.

Reader Links to DG Minis

DIAMOND BAR, Calif. – A portable paper tape reader system for Data General Corp. (DG) minicomputers is available from Data Syst.

The self-contained system includes a 300 char./sec reader, power supplies, interface and connecting cable for the DG systems.

The unit costs $495 from Data Syst at 23615 Decorah Road, Diamond Bar, Calif. 91765.

Calcomp Antitrust Trial Told

IBM Market Share Never Fell Below 60%: McGovern

By Molly Upton
Of the CW Staff

LOS ANGELES – IBM's share of the general-purpose computer market never dropped below 60% from the 1960s through 1972, according to testimony admitted in the first week of California Computer Products, Inc.'s (Calcomp) antitrust trial against IBM.

Moving rapidly through readings of excerpted testimony and depositions of seven DP executives taken in the U.S. vs. IBM case, Calcomp attempted to establish the preponderance of IBM in these markets and the effect of its size upon other competitors.

On the seventh day of trial, the jury saw its first "live" witness, Patrick J. McGovern, chairman of International Data Corp., a market research firm whose statistics had previously been cited by each executive whose statements were read into evidence here.

McGovern indicated IBM's share in terms of monthly rental value of installed general-purpose systems with IBM processors in the U.S. ranged from 65% in 1964 to 68% in 1975, with a low of 63%. His definition of general-purpose machines excluded minicomputers.

Inroads made by plug-compatible manufacturers (PCM) into IBM's portion of the U.S. general-purpose market began in 1969, when they held a 1% share, he said.

This increased to 7% in 1973 and was at 8% in 1975.

McGovern attributed the greater PCM share during the later years to the use of independents' memory and printers as well as disk drives, tape drives and terminals. He illustrated his testimony by citing figures representing IBM's market share.

In 1969, for instance, IBM's share of the market for IBM systems with PCM equipment was 69%; when the value of attached PCM gear is excluded, however, that share drops to 65%, he said.

The figures were 69% and 67% respectively in 1970; 68% and 65% in 1971; and 67% and 63% in 1972, he said.

IBM's total system share jumped to 69% in 1973, but dropped to 62% for all-IBM systems. The figures were 68% and 62% in 1974 and 68% and 60% in 1975, he noted.

McGovern indicated IBM's share of the market for disk drives attachable to 360s and 370s reached a low point of 80% in 1975, or 75% if the 3340 is excluded.

At the end of 1971, the IBM share of the installed base of 2311s, 2314s, 2319s, 3330s and their equivalents was between 84% and 87%, he said.

New York Inclusions

Topics covered in readings from the New York antitrust case included executives' rankings of firms in the industry, considerations when they priced their products, the pros and cons of leasing equipment and why the market was oriented toward leasing.

The testimonies read in the three days following Calcomp's and IBM's opening arguments were from Robert E. McDonald, president of Sperry Rand; Edwin S. McCollister, who held posts at Burroughs, Univac and RCA; and John J. Hangen, NCR senior vice-president.

Others were Robert S. Oelman, chairman of NCR's executive committee; William C. Norris, chairman of Control Data Corp.; Anthony L. Conrad, president of RCA; and parts of testimony by Clarence Spangle, president of Honeywell Information Systems (HIS).

The executives' estimations of IBM's share of the general-purpose computer market ranged from 60% to 75% with the other mainframers' portions ranging from 2% to 10%.

Several indicated the industry was lease-oriented because customers preferred this and IBM offered leases; therefore, in order to be competitive, they were compelled to follow suit.

However, they said, leasing was a drain on their resources and in some cases limited their ability to conduct extensive research and development.

McDonald stated Univac was competitively disadvantaged by leasing since revenues were not realized until well after the initial installations.

However, he added, long-term leases were favorable because they tended to protect the installed base from IBM and gave a vendor a chance to realize more revenues over the long term than a sale.

McCollister said short-term leases expose one's base to the competition.

Hangen said NCR in 1967 had invested

(Continued on Page 50)

Mini Makers Unimpressed by Series/1

By Toni Wiseman
Of the CW Staff

IBM's recent announcement of the Series/1 [CW, Nov. 22] went off with more of a fizz than a bang, a survey of minicomputer manufacturers revealed.

Most were unimpressed with the new competition and did not expect adverse effects on their own market shares. One industry observer, in fact, commented that while the industry had geared itself for the onslaught of a tiger, it had been presented with a little kitten.

He noted, however, that kittens can grow up into tigers.

Dick Anderson, general manager of Hewlett-Packard's Data Systems Division, found the system "a little modest for where the state of the art is with the available technology in both hardware and software.

IBM Holding Back?

"You get the feeling IBM is holding back, that it's not that interested in making the minicomputer look too good compared to the large computer," he said.

The Series/1 had some features that were attractive, but also some surprises, Anderson said. Among the surprises was the lack of a discount policy, which he interpreted as meaning IBM does not intend to participate in the OEM market.

Anderson was also surprised the Series/1 does not offer any high-level languages. "I don't think a macro assembler will carry you very far, although it's hard to speculate what might still be in development," he said.

The Series/1 communications are, however, very attractive, he added, with the availability of asynchronous, bisynchronous and Synchronous Data Link Control protocols.

"My initial response is that we're not terribly worried by it," he said. "In many respects, it has a good news side to it in that it seems to me IBM participating in this marketplace is a recognition that distributed data processing and distributed computing are realities and here to stay," Anderson said.

David H. Methvin, president of Computer Automation, Inc., doesn't think the Series/1 will have any effect on his company, either positively or negatively.

"We don't see it as a competitor in our OEM business because it's such a very, very expensive piece of equipment," Methvin said.

"And on the upper end, in the end-user division, I don't see it as a threat to Syfa, which is a heavily software-oriented activity; that doesn't seem to be the kind of thing IBM is targeted on," he added.

While the IBM system is not causing him any headaches now, Methvin said it is impossible to tell what the giant might do three to four years down the road when it could very well change its tactics.

'Evolutionary Step'

Digital Equipment Corp. was also indifferent to the Series/1.

"As with previous small computer announcements, IBM's latest seems to be another evolutionary step in its development of small computer systems with its broad product range," a DEC spokesman said.

"This announcement is consistent wi the trends in computing which have been developing over the past 10 years. The IBM announcement has not tempered our expectations for continued growth and could possibly serve to expand markets for all major suppliers," he said.

'No Real Surprises'

Rowland H. Thomas, vice-president of product marketing for Data General, termed the announcement "very interesting.

"There were no real surprises in the announcement, based on the rumors we have been hearing for some time.

"We believe the announcement will stimulate demand for the computer industry in general and for the minicomputer industry in particular. As far as impact on use, we feel we have a strong and very broad product line and we will certainly get our share of that market expansion," Thomas said.

Jim Orris, vice-president of marketing for Varian Data Systems, expressed the opinion that "perhaps [IBM] is making a mistake coming out with a machine without software," particularly since "the key to the market it is going after is sophisticated software."

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Lear Puts ADM-3 In Kit Form

ANAHEIM, Calif. – Lear Siegler, Inc.'s Data Products Group is supplying its dumb ADM-3 CRT terminal as a kit to hobby stores with shipments running between 250 and 300 unit/mo and growing between 5% and 10% per month, according to Lee Falco, group general manager.

The decision to provide kits was made only hours after a computer store manager persuaded Falco there was a market, he said.

While Lear generally tries to maintain a low OEM profile, it is becoming known to end users through its kits, he said. However, Lear treats the kit sales to store owners as it would to OEMs, and all support and maintenance is provided by the stores.

Since the day in August when a store manager walked out with some incompleted units off the line, Lear has shipped over 1,000 terminals in kit form, he said.

To the end user, there is a real savings with kits if he's willing to put in the time, Falco said. An ADM-3 purchased from an OEM by an end user would cost as much as $1,500, but the kit price from store dealers ranges between $840 and $875, he noted.

Looking at the OEM terminal market, Falco admitted it is still very competitive. "I think it will continue to bottom out, forcing people into broader profit bases," he observed.

The price competition extends across the board into intelligent terminals as well as dumb terminals, he said. Large quantity OEM prices for dumb terminals are under $900.

Vertical Integration Profitable, Perilous

By Esther Surden

Of the CW Staff

SAN FRANCISCO – "Building your own peripherals can be a two-edged sword: It can increase your profit picture substantially and open new markets for you, but if you are not really prepared it can wind up costing you a lot more than your supplier's profit margin," according to Leonard S. Bleininger.

The company considering vertical integration should look at the "build-buy decision" and, if the cost to get into the business divided by the difference between purchase and cost to manufacture is less than the volume of expected sales, building may be the answer, Bleininger, vice-president for peripherals at Microdata Corp. told a group at a recent conference.

Start-up, tooling and facility costs are important to consider as well as the average cost of the total number of systems that will be built. Increases and decreases in the prices should be projected realistically, he said.

The projected volume requirement should include only those units the company expects to sell through including them in its own end-use systems, Bleininger stated. Any additional projections for OEM sales should not be added into the calculation.

If the company decides building is the way to go, it should be sure the total start-up and development times take as short an amount of time as possible.

Rapid obsolescence is characteristic of peripherals and a company that takes longer than necessary may find its new product obsolete in both performance and price, he said.

The decision of which of many devices to build is a difficult one, Bleininger indicated.

"Ask your marketing people which of these products will improve your company's overall reputation for technical excellence and which of these products would be more marketable to system builders," he continued.

Perhaps the purchasing department has had some problem procuring a product on time or at all; if so, the company could build that product, he said.

A company that has decided to buy its peripherals can choose from "multiple sources with only small performance/quality differences and even less difference in price," he warned.

"However, there is no alternative to a good relationship that you've had with a vendor for a long time," Bleininger advised. "If you are not fortunate enough to have a good relationship with a supplier, you must try to talk to people to whom he's currently supplying the product."

Companies to Consider

Two types of companies, the independent supplier and the peripheral supplier which also assembles its own system can be dealt with, Bleininger said. "There is a natural reluctance to purchase from the systems assembler since they may be a competitor in the marketplace.

"The fact is that with the increasing cost of developing today's more sophisticated peripherals, the independent supplier does not have the sales volume necessary to support the development effort.

"As the inevitable consequence, the independent supplier is disappearing and merging with system assemblers," he said.

The supplier's financial strength must be carefully considered as well, he added.

Contracts should include quantity discount price terms so that during the period of the contract the company is invoiced at a discounted price. However, if the firm buys less than its estimate, a retroactive adjustment will take place, Bleininger noted.

A condition should be written into the contract that stipulates if the supplier adjusts his going market price downward during the contract period, the company gets the benefit of the price reduction and "will not be required to pay a higher price if the adjustment is upward, he said.

Court Order Rules EMM Seizure Illegal

LOS ANGELES – The U.S. Court of Appeals for the Ninth Circuit here has ruled a 1972 U.S. Customs Service search of Electronic Memories & Magnetics Corp. (EMM) premises and seizure of documents violated the Fourth Amendment prohibition of unreasonable searches and seizures.

The order requires Customs to return all documents seized from the company under illegally obtained warrants.

The court's order, reversing a 1974 district court decision, related to a dispute pending since 1972 when Customs seized EMM's records and instituted proceedings which charged the company with undervaluing imports from its foreign assembly plants and sought a penalty for underpayment of customs duties.

In July 1975, Customs proposed to settle these proceedings for a mitigated penalty plus alleged loss of revenues totaling $2,841,239.

The company did not accept that proposal and has filed a supplemental petition for further reduction or remission of the penalty sought, which is still pending.

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Introduction Set Next Month

Software AG Planning TP Package Debut

By Toni Wiseman

Of the CW Staff

RESTON, Va. – With a new product on the horizon and a solid installed base of 200 users, Software AG feels confident about the future and the role it will play in the software industry.

The firm will be introducing a yet-to-be-named teleprocessing (TP) package in January which, according to John Maguire, president, is "unique" and combines the "best of the rest of the packages available."

Software AG's offering is a "combination of TSO, IMS/DC, CICS, Taskmaster, Shadow and others, but without the overhead," he said.

Many of the transaction-oriented packages currently available for on-line programming are inefficient in terms of human time, Maguire said, "and with the cost of labor going up this on-line programming capability is much more attractive.

"In fact it's so attractive that people pay a tremendous overhead penalty for having it," he added. "A typical TSO installation will take about one million bytes of core. That's a lot of money, but there are still a lot of installations out there."

For IBM Users Only

Software AG's typical TP installation will require some 180K bytes and will handle 50 to 60 terminals, with the core climbing to 300K as the number of terminals approaches 250, he said.

Written in Assembler, the soon-to-be-introduced product will run on any IBM processor but will not be available for non-IBM mainframes.

"IBM is 75% of the market and that's where most of your software products and companies gravitate. You have to make it economical," Maguire said.

"For five years we've been getting calls asking whether we're going to bring Adabas to Univac or Control Data Corp., and it isn't worth the effort.

"We'll go to the minis because then I'm looking at the 1980s and I see a million units out there, and then it's worthwhile. But it's not worthwhile trying to sell it to the 300 CDC 6000 series installations," he said.

Software AG has already begun converting its Adabas data base management system (DBMS) to minis, but it is not yet ready for release, Maguire said.

It is obvious that data base is the way of the future, he stated. It's taken six years for the market to reach the 30% saturation point, he noted, predicting that within the next 18 months 60% of the medium- to large-scale IBM CPUs will have a data base system.

"And that means most people in the data base system business will double their business in the next 18 months. We'll go from 200 to 400 Adabas installations," he said, adding Software AG currently has 6% to 7% of the installed DBMS base as opposed to nothing five years ago.

Software Industry Booming

The software industry itself is booming, Maguire said, estimating industry revenues should now be close to $600 million a year, growing 35% per year, up from $3 million in 1965.

The industry's growth is primarily a result of increased user buying, but also is a result of pricing.

"I've long believed software has been underpriced. A lot of companies went out of business because they weren't charging enough. They were pricing on costs rather than on value and if they made a slight mistake, they caught it financially," he said.

In keeping with his philosophy of pricing the package at its long-term worth, Software AG's TP package will sell for $60,000 initially; other packages on the market range from $15,000 to $58,000 for Cullinane's Shadow.

Maguire noted, however, that as soon as Software AG has established a user base, the price will increase to $90,000 or $100,000, "so I won't hurt any of the guys at the low end of the scale.

"This of course means we won't get all the users, just as we only have 6% or 7% with Adabase. But that's all right, I don't want them all."

"I just want to ensure that it's priced right to make it profitable and to allow for R&D and enhancements."

Small Disk Group Formed by Calcomp

ANAHEIM, Calif. – California Computer Products, Inc. (Calcomp) has formed a Small Disk Operations (SDO) group.

SDO, which has its own profit and loss responsibility, has assumed the company's floppy disk drive and formatter products as its initial product line.

The operation is staffed with personnel transferred from the company's existing line organizations and has its own production, engineering, quality assurance and marketing groups.

Certain functions such as sales, service and purchasing, however, will continue to be performed by centralized groups within the company.

Xerox, Qume Settle

HAYWARD, Calif. – Xerox, its Diablo Systems subsidiary and Qume Corp. have settled their patent litigation on daisy-wheel impact printers.

Xerox had charged Qume and one of its founders with patent infringement and trade secret misuse. Qume countersued charging patent abuse and antitrust violation.

Under terms of the settlement, the litigation will be dismissed with neither party admitting liability. Xerox will receive a percentage royalty with an initial payment under one of the licenses.

In addition, both parties will enter into a broad cross-licensing agreement covering the manufacture and sale of daisy-wheel printers.

Both parties declined to discuss the details of the settlement, acknowledging only that each had agreed to bear its own costs in the litigation.

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IBM Share at Least 60%: McGovern

(Continued from Page 47)

heavily in offering its Model 315 on a rental basis; its inability to secure additional capital for leasing limited its number of Model 615 installations.

As an indication of the expense of capitalizing a lease base, Oelman said NCR has put $700 million in a rental pool since 1960. Between 90% and 95% of NCR systems are on lease, he said, adding "where users demand it, a company has no choice but to offer" leasing.

Price Competition

Several mainframers tended to price their products about 10% below IBM prices, the depositions indicated, although McCollister said RCA tried to offer more for the same price.

As an example of the other mainframers' positions, Calcomp lead attorney Max Blecher selected Spangle's statement that IBM could, theoretically, put Honeywell out of the DP business. This could occur, Spangle said, since IBM's profits are about 25% and HIS' total about 10%.

By effecting a drastic price reduction or by failing to raise prices when inflation drives production costs up, thus preventing others from raising their prices, IBM could cause a reduction in HIS profits, Spangle said.

The seriousness of such theoretical actions would depend on the length of time and the resources of Honeywell, Inc., Spangle's record stated. He said he had no indications IBM plans any such actions.

Competitors felt extreme pressures to announce products following IBM announcements, the depositions indicated. McCollister said RCA rushed into its announcement of the 70/45 eight months after IBM told the world about its forthcoming 360 series.

The executives also mentioned the time lag in following with equivalent products, such as those for IBM 2311 disk drives. McCollister said RCA purchased 2311s from IBM, which impacted its profitability since it paid list price.

Boies concentrated on internal weaknesses within various companies and certain admittedly poorly conceived machines.

The RCA series impacted the installed base of Spectras rather than attacking the IBM base, for example; this had a negative impact on RCA revenues since it was a lower priced machine, McCollister said.

At least six memories on the RCA 70/55 failed and had to be replaced. Only five 501s were made, McCollister said, because of manufacturing difficulties and also because of higher than estimated costs.

When questioning NCR witnesses, Boies attempted to point out that in measuring its installed general-purpose base, NCR excludes those CPUs which it categorizes as terminal systems, thus making its market share smaller than it might be.

Mini Maker Offering Micro

ANAHEIM, Calif. – With its GA/16 110-120 microcomputer, General Automation, Inc. (GA) can offer a packaged system at about 20% less than one with the SPC-16 mini, according to Thomas W. Dillman, manager of microcomputer product sales.

The savings are even more substantial when peripherals are excluded, he said. The price of a chassis using the micro is about 40% less than with the mini; on a board level, the price is about 90% less, he estimated.

Dillman expects the micro to replace the mini at the bottom end of GA's line. "It's a more cost-effective way to build a seven-year-old SPC-16," he said, adding it is a true 16-bit machine.

The specially designed micro offers two key advantages: inherent cost savings and support of GA's previously developed software, Dillman said.

Since the micro was designed to pattern the SPC-16, it handles all the software available for the older machine, he noted.

It can support up to 300M bytes of disk, 1,600 bit/in. tape drives and a variety of languages including Ansi Cobol, Fortran and Basic.

With the language availability, OEMs can get their product to market quickly since programmers in these languages are more widely available than those versed in Assembly, the principal language supported by several other micros, he said.

GA designed the micro to handle input/output rapidly, Dillman said. It has a direct memory access of 2.5M byte/sec without cycle stealing and its performance in handling the larger peripherals is as good or better than most SPC-16s, he said.

Currently most of GA's micro orders are for the customers wanting a packaged system, he said, and he expects this sector to continue to grow.

Once GA adopted the concept of turning out lower priced items in larger quantities, Dillman said, the firm had to do some reorganizing. He categorized the firm as one that had made pistachio ice cream, or specialized high-price systems such as those for Bank of America.

But Dillman's idea was to make vanilla and, he observed, one cannot extract vanilla from pistachio. But by orienting itself toward the larger production volumes of vanilla, GA could lower the production costs more and add the pistachio; or tailor systems once they were built.

Synertek supplies the microprocessors to GA, which owns one quarter of the outfit along with American Satellite Corp., Bulova watch and Unitrode, he said.

Expansions

Century Computer Corp., formerly of Dallas, Texas, and Walnut Creek, Calif., has moved to larger quarters at 2339 Stanwell Circle, Concord, Calif. 94520.

Informer, Inc. has moved its executive offices and plant to a 20,000 sq-ft facility at 8332 Osage Ave., Los Angeles.

Harris Corp. has authorized an expenditure of $7.5 million for construction of an integrated circuit plant adjacent to its Melbourne, Fla., facility.

Process Computer Systems, Inc., a manufacturer of industrial microcomputer systems, will move its operations from Flint, Mich., to a 24-acre site near Ann Arbor.

Universal Software, Inc. has opened a West Coast office at Suite 324, 3868 Carson St., Torrance, Calif. 90503.

Applied Digital Data Systems, Inc. has opened a 60,000 sq-ft addition to its headquarters plant in Hauppauge, N.Y.

Zentec Corp. has begun construction of a 35,000 sq-ft facility near the firm's headquarters in Santa Clara, Calif.

COM Service Bureau, Inc. of Boston has opened an office in Portland, Maine.

True Data Corp. has moved to new headquarters at 17092 Pullman St., Irvine, Calif.

Modular Devices, Inc. and its subsidiary, Modular Audio Products, have moved to new headquarters at 50 Orville Drive, Bohemia, N.Y. 11716.

Datapoint Corp. has leased 1,793 sq ft at 4440 Von Karman Ave., Newport Beach, Calif., and will open a sales office there.

Vercoe & Associates, a minicomputer business systems firm, has moved its headquarters to 4040 MacArthur Blvd., Newport Beach, Calif.

Digital Systems Corp. has opened its 20,000 sq-ft headquarters facility at 3 N. Main St., Walkersville, Md. 21793.

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French Firm Stressing Quality, Service to Gain Toehold in U.S.

By John P. Hebert
Of the CW Staff

LOS ANGELES – What does a French equipment manufacturer do to gain users in the U.S.?

It shows a dedication to quality and service, according to Richard L. Swarz, general manager of the U.S. division of Logabax S.A., headquartered here.

The first goal of Logabax' American division is to develop a good image of both the company and its products in the minds and eyes of the users, Swarz said.

"We plan to be here for a long time and to grow, so we must have an excellent reputation. We won't oversell or puff" our product line of printer terminals, he said.

Although its European counterpart is heavily targeted toward the OEM area, the U.S. division is primarily oriented toward the end user and OEMers second, he said. The response has been "superb" in the end-user marketplace, with solid foundations laid in California, notably at TRW, Inc. and Lockheed, he noted.

Changes in Users' Wants

Logabax has also seen changes in what users want since the American division's start-up in March 1975.

"Eighteen months ago, we saw a fascination with IBM's Synchronous Data Link Control (SDLC). Today we're in the process of quoting delivery on multicompatible devices – those are what the user wants," Swartz stated.

It is difficult to implement SDLC for interactive terminals, he claimed, adding if a terminal manufacturer doesn't have a migration capability, then it will "get shut off from possible users because the future impact of SDLC is so important.

"We are very happy that IBM moved to a matrix printing technique in interactive terminals, created an SDLC environment and that SDLC is not here in full force today – although we are very much prepared for SDLC," he said.

Users in Transition

The U.S. division is approaching users who are in a transition from the concept of slow printing and slow communications speeds to higher printing and transmission rates, according to Swarz.

"We are offering efficiency to a company through its employees and, because of this, there is more time available for employees to do other things.

"Logabax realizes most people pay for communications by time, through the cost of the communications itself and also through the personnel involved."

"We won't change in the future, In fact we will be going more in that direction," Swarz said, noting Logabax hopes to "provide a better tool for users to cope with an ever-growing demand for information on an interactive basis."

Logabax has whittled a niche in the U.S. with its 180 char./sec printers which are capable of synchronous and asynchronous communications at 1,200-, 2,400- and 4,800 bit/sec speeds, he said.

This area will continue to be the firm's bread-and-butter product line in the future, Swarz predicted.

Future Predictions

In the future, Swarz continued, Logabax plans to give the user more design capability to be able to react to input – something which hard-wired logic doesn't permit.

In addition, Swarz saw Logabax pioneering a part of the terminal market which is not yet popular – 1,200 bit/sec asynchronous communications at both 2,400- and 4,800 bit/sec rates.

The company now offers 300- and 1,200 bit/sec printing capability "because it provides a better tool for the user," he added.

The existing 300 bit/sec area, according to Swarz, is here already and 1,200 bit/sec capability is "just beginning to take off.

"We hope to see other major vendors in that area because it will create marketplace expansion," he said.

Logabax' latest terminal introduction, the LX1010, has "all the asynchronous protocols we are aware of today and all available synchronous protocols," he explained.

Swarz noted it is convenient for the user to have one machine rather than two terminals due to changes in communications protocols.

With the LX1010, he said, the user only needs a different program to allow communications with different computer equipment.

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201C	SLD	462	1,512/yr	25
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209A	SLD	4,316	5,676/yr	10
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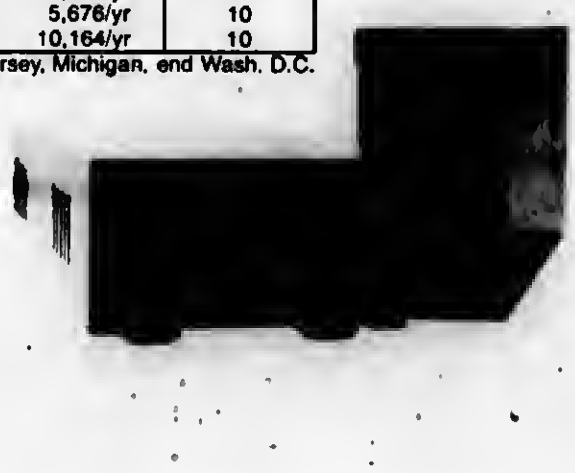

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Canadian DPers Told to Take Part In Drafting Privacy Protection Laws

TORONTO – Canadian DPers should participate in drafting legislation to protect privacy, Harvie Andre, a member of Parliament, told attendees at the annual meeting of the Association of Data Processing Service Organizations (Adapso).

Andre said he is very concerned about the lack of real public discussion on the proposed Canadian privacy law and has "very little faith" the bureaucratic decision will be good.

International News

"I'm afraid it will be awful and put a burden on the industry," according to the former member of the management committee of the University of Calgary DP center.

Bill C72, which has been presented to the Cabinet for consideration, is designed to protect the individual's rights in all data banks except those the Cabinet feels might damage international relations or those which pertain to criminal records, he said.

Andre said he is concerned about the lack of legislation that interrelates the protection of privacy and the freedom of information.

He advocates removing the protection of privacy from C72 and making this issue the principal part of another bill.

"DPers should take the initiative and take their ideas to the government on how these issues should be attacked. Then it is more likely the law will be something that can be lived with," he said.

Andre, a member of Canada's Progressive Conservative party, decried the 600% increase in governmental DP expenditures over the last four years.

This rise, to $205 million in 1975, was in direct contradiction to government promises that it would seek to hold down spending in this area by awarding work to outside vendors, he said.

In the early 70s, 60% of the government's DP expenses were for in-house services. That figure is now 65%, he said.

Information Checklists Offered

WASHINGTON, D.C. – As an aid to those contemplating doing business in France, Belgium or the Netherlands, the U.S. Department of Commerce has published a series of reports on various aspects of the countries and their ways of doing business.

Information checklists detailing the reports are available by writing to Peter B. Field, country marketing manager, France/Benelux, Office of International Marketing, U.S. Department of Commerce, Washington, D.C. 20230.

Several reports on markets in France are available from the National Technical Information Service (Ntis) for $10 each.

These include: Computers & Related Equipment, DIB 76-07-502; Business Equipment & Systems, DIB 75-09-503; Communications Equipment & Systems, DIB 76-05-503. These can be ordered prepaid from Ntis, U.S. Department of Commerce, Springfield, Va. 22151.

Foreign Orders & Installations

Amalgamated Quarries Ltd., based near Edinburgh, U.K., has installed a 2903 system from International Computers Ltd. to be used for invoicing, sales statistics, payroll and other accounting applications.

GEW-Werke, a public utility owned by the city of Cologne, West Germany, is installing a Univac 1100/12 system including more than 50 terminals to be used for customer and personnel information systems, warehouse and material accounting, payroll, financing, billing and energy calculations and forecasts.

The government of the Sudan has ordered a $19 million satellite communication system with a $10 million expansion option from Harris Corp. to consist of 14 earth stations and communication complexes.

Travis and Arnold Ltd., a British timber importer, has ordered a 2903 system from International Computers Ltd. to be used for sales ledger, sales analysis and invoicing.

Svenska Cellulosa AB has ordered a Measurex 2000 digital process control system for magazine production.

Delfin Rio S/A, Brazil's largest savings and loan association, has ordered Burroughs Corp. equipment including a B3700 system, 120 TU 1700 financial teller terminal systems, 60 TD 700 input and display systems and 60 DC 110 data communication controllers.

Financial News

Although Revenues at Record High

Sanders Year Earnings Take Steep Dive

By Ronald A. Frank
Of the CW Staff

NASHUA, N.H. – Although revenues for Sanders Associates, Inc. reached an all-time high in fiscal 1976, earnings took a steep dive, according to Harold Pope, chairman and chief executive officer.

Speaking at the Sanders annual meeting here recently, Pope said corporate revenues in the year ended July 30 rose to $198 million compared with $180 million in 1975.

But earnings plunged from almost $15 million in 1975 to $5.7 million in 1976, partly as a result of an "extraordinary tax credit" in 1975 of $2 million, according to M. Joel Kosheff, vice-president for finance.

Revenues for Sanders Data Systems (SDS) increased to $28 million compared with $25.3 million in 1975. This resulted in a reduced operating loss at SDS of $6.1 million compared with $9.2 million in 1975.

SDS went into a "positive cash flow" in April of this year and fourth-quarter customer bookings for the firm's CRT line reached $9 million, according to M. Andrew Haladej, group vice-president.

Haladej reported good customer acceptance of the Sanders 8170 terminal series which, he said, provides users with better migration paths through software. The series has resulted in five new products, including the SDS 8180 replacement for IBM 3270 CRTs.

Sanders also recently introduced CRT replacements for Honeywell, Burroughs and Univac terminals.

IBM Case 'Proceeding'

Pope told stockholders the Sanders antitrust trial against IBM is "moving along" and preparations "must be complete and thorough to challenge a force like IBM."

Up to now six million IBM documents have been examined in the discovery phase with 350,000 of these entered into a computerized data base.

Written depositions of IBM personnel will begin in January, with the trial now scheduled to begin at the start of 1979, Pope said.

"Litigating with IBM is very much like competing with IBM," attorney Joseph Millimet told the stockholders. Millimet is the lead attorney from the law firm of Millimet, Branch, Devine and Stahl, which is handling the suit for Sanders.

Asked by a stockholder how much Sanders is spending on the suit, Millimet said this information would be important to IBM and could not be divulged.

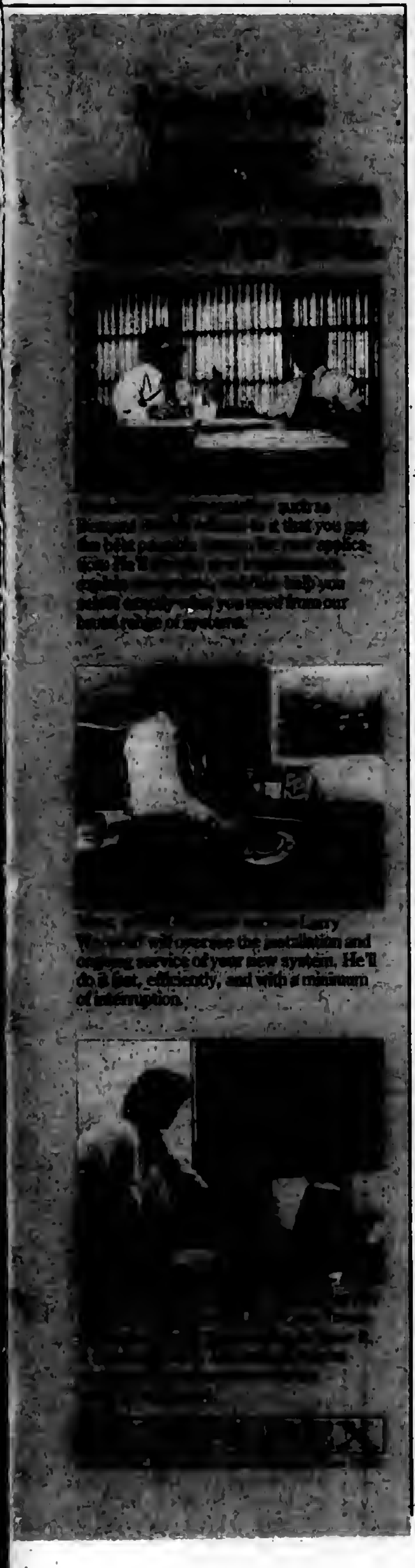
But Sanders has 25 staff members working with outside counsel on the case, he said.

The cases brought by California Computer Products and others against IBM "are substantially similar" to the Sanders suit, but in different product areas, and their outcome will have an effect on the SDS litigation, Millimet said.

"We are doing everything we can to advance the trial date," he said.

The fiscal 1976 sales of the Federal Systems Group rose to $164.8 million compared with $148.7 million in 1975. The Component Products Group had a drop in sales from $2.4 million in 1975 to $790,000 in 1976.

First-quarter operating results for fiscal 1977 will be released soon and will show an improvement over the comparable period last year, Pope reported.


[illegible] Larry [illegible] will oversee the installation and ongoing service of your new system. He'll do it fast, efficiently, and with a minimum of interruption.

DDI Revenues Gain

GREENWICH, Conn. – Data Dimensions, Inc. (DDI) reported revenues of $5.9 million for the nine months ended Sept. 30, an increase of 65% over comparable 1975 revenues of almost $3.6 million.

Income after provision for taxes, but before benefits from the application of tax-loss carryforward from prior years, increased 15% to $337,000 or 44 cents a share from $293,000 in the year-ago period.

Because of the availability of $50,000 in tax-loss carryforward in 1975, net income for the year-ago period was $343,000 or 44 cents a share.

For the third quarter, revenues were $2.1 million, an increase of 63% over revenues of $1.3 million in the 1975 quarter.

Third-quarter earnings were $117,000 or 16 cents a share compared with $114,000 or 15 cents a share in the year-ago period.

Data 100 Net Drops in Quarter

MINNETONKA, Minn. – Data 100 Corp.'s sales during the third quarter were better than in the comparable period a year ago, but the company's earnings fell below expectations, according to Edward D. Orenstein, president.

Earnings for the period totaled $1.15 million or 28 cents a share, including a $373,000 tax credit, compared with $1.85 million or 44 cents a share including a $780,000 tax credit in the year-ago quarter.

Revenues, however, rose to $30.2 million compared with $24.6 million in the same quarter last year.

For the nine months, earnings also dropped, to $3.5 million or 88 cents a share including an $858,000 tax credit, compared with $4.8 million or $1.18 a share with a $2 million tax credit in 1975.

Revenues for the nine-month period increased to $53.2 million compared with $38.3 million in the 1975 period.

Both third-quarter and nine-month results were significantly affected by foreign exchange losses amounting to $1.3 million in the nine months and $607,000 in the third quarter, Orenstein noted.

In the comparable periods in 1975, such losses were $317,000 and $319,000 respectively, he said.

Exchanges Rates at Fault

"The losses were primarily due to the deterioration in the exchange rates of the currencies in the UK and Ireland, where a substantial part of [Data 100's] overseas business is concentrated," he noted.

"Our current financial situation restricts us from taking many of the usual steps to hedge against foreign currency fluctuations, but we are exploring several methods of minimizing our exposure to these losses in the future," he added.

While Data 100 currently has a number of programs under way to strengthen its activities in product planning, engineering, customer service and marketing administration, "shortage of cash is still a major difficulty and is currently restricting the company's growth," Orenstein said.

"The market is such that we can sell or lease everything we build, but capital constraints have kept us from building enough products to sustain desirable growth," he concluded.

Nickels & Dimes

Control Data, as a result of substantially reduced credit requirements, has arranged a new $100 million domestic revolving credit agreement to replace a $165 million line due to expire on Jan. 1, 1978.

The new credit line, arranged with a group of 25 banks led by Chase Manhattan, will terminate Jan. 1, 1979.

$ $ $

Western Union International has declared a quarterly dividend of 20 cents payable Dec. 13 to holders of record Nov. 29.

Sycor has filed an application to list its common stock for trading on the New York Stock Exchange. The company's common stock is presently traded on the over-the-counter market.

$ $ $

Burroughs has declared a 17-cent dividend payable Feb. 7 to holders of record Jan. 7.

$ $ $

Digital Equipment Corp. shareholders have approved a three-for-one stock split, increasing the authorized capital stock from 36 million to 50 million shares.

Data Card has declared a 3-cent dividend payable Dec. 8 to holders of record Nov. 26.

$ $ $

Datronic Rental will offer to all debenture holders of the company to purchase for cash up to $492,000 principal amount of its 7% convertible subordinated debentures due March 15, 1984.

$ $ $

Honeywell has declared a dividend of 40 cents payable Dec. 13 to holders of record Nov. 26.

New Registrations

GRAPHIC SCANNING CORP., 99 W. Sheffield Ave., Englewood, N.J. 07631, a computer service firm, filed to register 75,000 shares of common, to be offered for sale by D.H. Blair Securities Corp. at prevailing prices in the over-the-counter market at the time of sale.

MRI SYSTEMS CORP., 12675 Research Blvd., Austin, Texas 78766, a software products firm, filed to register up to 1,336,589 shares of common. The registration statement covers the merger of MRI Systems Corp., a Texas corporation, into a newly formed Delaware corporation with the same name. No underwriter is involved.

ITEL CORP., One Embarcadero Center, San Francisco, Calif. 94111, a data services firm, filed to register 2,107,128 shares of common to be issued in connection with the acquisition of Autax, Inc., and Computer Dimensions, Inc. No underwriter is involved.

INSTITUTE FOR SCIENTIFIC INFORMATION, INC., 325 Chestnut St., Philadelphia, Pa., a publications firm, filed to register 330,708 shares of common, to be offered for sale through underwriters headed by Fahnstock & Co., 110 Wall St., New York, N.Y. Of these, 100,000 will be sold by the company and 230,708 by certain selling shareholders.

COMSHARE, INC., 3001 S. State St., Ann Arbor, Mich. 48106, a remote processing firm, filed to register 122,500 shares of common, to be offered for issuance in a proposed merger of Trilog Associates, Inc. of Philadelphia into Comshare. No underwriter is involved.

MOHAWK DATA SCIENCES CORP., 1599 Littleton Road, Parsippany, N.J. 07054, a data entry firm, filed to register 400,000 shares of common, issuable upon the exercise of the company's common stock purchase warrants presently held by Source Capital, Inc. Allen & Co. Inc., 30 Broad St., New York, N.Y. 10004 will be the managing underwriter.

Pertec Targets Both Ends of Peripherals Spectrum

By Toni Wiseman
Of the CW Staff

CHATSWORTH, Calif. – The 32-bit "super minis" which have appeared on the market in the past two years have been benchmarked against machines up to the IBM 370/138 in terms of performance, but with greater improvement in price/performance, according to the president of Pertec Computer Corp.

As a result, companies like Pertec are anticipating the need for higher performance peripherals, Ralph Gabai said, and 50M-, 100M- and 200M-byte disks are becoming common.

At the other end of the spectrum, micros are finding application in all areas; this means a need for more peripherals, price-compatible with the micros which can be acquired for $250, Gabai said.

Therefore, Pertec and the newly acquired Icom are addressing both segments of the market, he said.

There are two totally different strategies for the peripherals the user wants, Gabai noted.

Electromechanical peripherals are highly labor sensitive; semiconductor technology is not. On the other hand, semiconductor technology requires a high front-end investment, he explained.

The price/performance ratio has been improving dramatically in this area, he added, but it is much more difficult to be price-compatible with micros than with minis.

All three Pertec product lines have been strong in the past year, Gabai said.

"There has been a higher growth rate in flexible disks and in cartridge disks. And the tape rate of growth is faster than the growth rate of the total marketplace," he said, noting "we're seeing the effect of several manufacturers who are not making it."

Gabai estimated tape would grow at a 5% to 10% compounded rate until 1980, with the higher performance equipment growing more as the low end starts to fall off.

Both rigid and flexible disks, on the other hand, should grow at a compound rate of 30% to 35%, he judged.

Disks will be going through their greatest cost/performance improvement now and during the next two years, he said.

Floppies vs. Tape

Disk sales are becoming much more significant, he said. Two years ago tape accounted for 90% of sales and disks for 10%; today, the ratio has shifted to 60%-40%, he said.

But, he added, that 60% is substantially higher than the 90% was in terms of quantity.

A year from now the ratio will probably be closer to 50%-50%, he predicted.

"There is no question the growth rate in disk will be much higher than tape, that disk will swamp out tape over the next two to three years," he said.

"But from Pertec's vantage point, tape will always be a major chunk of our revenues. There are always applications where tape will be viable, such as a hierarchy of tape technology backing up disk."

Executive Corner

- Seymour Naps has been appointed vice-president of Compuscan, Inc.
- Donald J.D. Connolly has been named group vice-president of sales; C. Patrick Houston, director of marketing; and Bert P. Headden treasurer of Carterfone Communications Corp.
- Frank J. Cummisky and Kasper V. Cassani have been elected vice-presidents of IBM Corp.
- John T. Hartley Jr. has been elected executive vice-president and Michael F. Maguire has been elected vice-president/group executive of Harris Corp.
- Daniel M. Ulrey has been appointed vice-president of marketing and William G. Brunswick has joined Computer Research Co. as vice-president of development.
- William A. Wells has been promoted to vice-president of international sales at Business Systems Technology, Inc.
- Robert L. Sikora has been appointed senior vice-president of finance at California Computer Products, Inc. (Calcomp).
- Robert B. McFarland has been appointed a vice-president of Dataproducts Corp.
- Nicholas W. Cardell has been appointed vice-president and general manager of international marketing for Bunker Ramo Corp.'s Information System Division.
- Hal G. Smith has been appointed vice-president of bank software development; Nestor M. de Armas, vice-president of finance; and Donald L. Parsons, vice-president of data services for Florida Software Services, Inc.

COMPUTER MANAGEMENT
United Kingdom

World rank as DP market: *Fourth*
1975 DP expenditures: *$2.7 Billion*
1975 imports from US: *$270 Million*
Rank as importer from US: *Third*

Computer Management is a monthly magazine recently purchased by Computerworld, Inc. Monthly circulation is 30,000.

COMPUTERWOCHE
Germany

World rank as DP market: *Third*
1975 DP expenditures: *$3.7 Billion*
1975 imports from US: *$274 Million*
Rank as importer from US: *Second*

Computerwoche is a weekly tabloid newspaper started by Computerworld, Inc. It has a circulation of 21,000 to the West German computer community.

SHUKAN COMPUTER
Japan

World rank as DP market: *Second*
1975 DP expenditures: *$4.6 Billion*
1975 imports from US: *$189 Million*
Rank as importer from US: *Fifth*

Shukan is a weekly tabloid newspaper, jointly owned by Computerworld and Dempa publications. Circulation is 35,000.

Zero-Un Informatique
France

World rank as DP market: *Fifth*
1975 DP expenditures: *$2.5 Billion*
1975 imports from US: *$223 Million*
Rank as importer from US: *Fourth*

Computerworld represents **Zero-Un Informatique** in the U S Zero-Un has three publications, one a weekly tabloid newspaper with circulation of 22,000, the second a monthly magazine, circulating 13,000 copies, and a new bi-weekly, Minis and Micros. All circulate throughout Europe's French speaking computer market.

DATANEWS
Brazil

World rank as DP market: *12th*
1975 DP expenditures: *$250 Million*
1975 imports from US: *$60 Million*
Rank as importer from US: *(Est) 10th*

DataNews is a bi-weekly tabloid newspaper in Portuguese with an English-language summary. It is owned by Computerworld, Inc. and has a circulation of 7,000.

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COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

'76 Sales Reach $110 Million

Low Profile Not Hurting SDC Revenues

By Toni Wiseman
Of the CW Staff

SANTA MONICA, Calif. – Systems Development Corp. (SDC) has always been a very conservative company, an image it still tries to project with a low advertising profile, several of the company's executives said recently.

Despite low-gear promotion, SDC had sales of $110.5 million for 1976, up from $108.6 million last year and more than double its 1972 sales of $51.1 million, according to M.J. Sargeant, manager of the Advanced Systems Department of the Research and Development Division.

SDC is predicting sales of $120 million for fiscal 1977, he noted.

The firm evolved as a spin-off from Rand, first as a nonprofit organization in 1956 and then as a for-profit company in 1969. SDC currently consists of four divisions – government systems; R&D; SDC Development Corp., which has its own subsidiaries; and SDC International.

The company also has two wholly owned subsidiaries – Mechanics Research, Inc. and Integrated Systems Support, Inc., a facilities management company.

Along with facilities management software and programming, SDC has expertise in the areas of turnkey systems, system/product design, training, simulation and operations research, Sargeant said.

In the business system area, SDC has ventured into financial data systems; command, control and communications; intelligence and surveillance; meteorological and geodetic systems; and energy and environment systems as well as text-editing and composition, education, search and transportation systems, he noted.

In the electronic funds transfer (EFT) area, SDC has a contract from the Savings Association Central Corp. (Sacc) of California, an association of savings and loan (S&L) associations, to develop an EFT system. Sacc is currently made up of 92 of the 172 California S&Ls, with more expected to join later, Sargeant said.

SDC has contracted to build a centralized dual-processor system for automatic transaction processing. System capabilities, according to Sargeant, will include transaction routing, audit trail creation, security control, interinstitutional settlement and terminal control.

The system will also support check authorization and off-line backup processing for participating institutions.

SDC, as it does under many of its contracts, will retain marketing rights for the system, allowing it to market the system to other states or regions. Customization would be necessary in each individual case, Sargeant noted.

"The field is wide open," he added. "EFT is a major business area for SDC. Our market share should grow to be bigger than for Text II."

Newspaper Mart 'Tremendous'

Text II, another product area for SDC, is prepared by the Electronic Publishing Systems Division. It is a computerized text-processing system which includes modules to handle not only the production cycle of a publishing firm, but also billing, accounts receivable, cash posting and management reports.

As in the case of SDC's EFT system, the user owns the hardware for Text II while SDC retains the rights to the software.

"The market for these systems is tremendous," Dale Blackwell, manager, said. "There are 1,400 papers that publish daily in the U.S. and, although we are only marketing to those with circulations of 20,000 or more, there is a wide area of opportunity.

"We're selling in the top circulation group now, but we are also getting requests from smaller papers. Our competitors have structured their marketing to satisfy the needs of these smaller users and we will also have to eventually," Blackwell said.

This could be accomplished by leaving off some of the "bells and whistles," he said, preparing a system with fewer capabilities or developing a system with only one CPU instead of the duplex system Text II uses.

Blackwell said that while the market in the U.S. will continue to be sufficient for a number of years, when it tapers off SDC will address the European market. In fact, the firm has already demonstrated the system to a paper in Helsinki, he noted.

Retrofitting is becoming a major part of the division's business, he said, upgrading systems both in terms of hardware and software.

SDC's major competition in the text-editing area comes from hardware manufacturers such as Digital Equipment, Harris and Autologic, he said.

"We have a reputation for being the best, but also for being the most expensive, and we're going to do something about that," Blackwell said. "We'd like to become more competitive."

Contracts

Collins Commercial Telecommunications Division of Rockwell International's Electronic Operations has been awarded a $13.5 million contract to supply computer-controlled switching equipment to ITT Corp. Communications Services, Inc.

System Development Corp. has received a $13.2 million contract to design, develop and maintain a telemetry DP system at Vandenberg Air Force Base from the Air Force's Space and Missile Test Center. The contract covers a period of five years and contains options for three one-year extensions.

Raytheon Co. has been awarded an $11.2 million contract for the Direct Access Radar Channel system by the Federal Aviation Administration.

Qume Corp. has received a $5 million contract from Anderson Jacobson, Inc. for 6,000 Qume electronic character printers.

The Westlands Bank in Santa Ana, Calif., has extended its facilities management agreement with National Sharedata Corp. at a cost of $5 million over a five-year renewal term.

Control Data Corp. has received a $6.8 million contract from the Raytheon Co. to supply computers for the Pave Paws phased-array radar.

3M's Industrial Graphics Division has entered into an OEM agreement with Logetronics, Inc. for 3M XL negative projection printing plates and processor.

Shugart Associates has signed a $3 million OEM contract with Wang Laboratories. The pact calls for deliveries of Shugart SA800 standard floppy disk drives and SA400 minifloppy drives over the next three years.

Dataproducts Corp. has signed an agreement with Astronautics Corp. to develop a line printer for use in secure government DP and message applications.

Applied Digital Data Systems, Inc. has signed a $1 million contract to supply Display Data Corp. with 1,000 CRTs.

CMC Division of Pertec Computer Corp. has been awarded an $840,000 contract from the Army's Computer Systems Support and Evaluation Agency. Under this agreement, CMC 1800 Keyprocessing systems will be chosen when a system with 16 or more keystations is needed by Army data entry installations within the U.S.

Kennedy Co. has received two contracts in excess of $220,000 for Model 330 single-transport cartridge recorders from Ohio Nuclear, Inc. and for Model 9000 tape transports from Motorola, Inc.

AT&T has renewed its contract with Leasametric, a division of Metric Resources Corp., for one year. The agreement grants discounts to all Bell Telephone companies on monthly rentals of testing instruments.

The System Monitoring Division of Rockwell International's Autonetics Group has been awarded a $3 million contract from Wisconsin Power & Light for a computer-based system to monitor and control electric and gas power.

Dataproducts Corp. has been awarded a $2.5 million contract by Univac for core memory systems. The memories will be used in the Automated Radar Terminal System for the Federal Aviation Administration.

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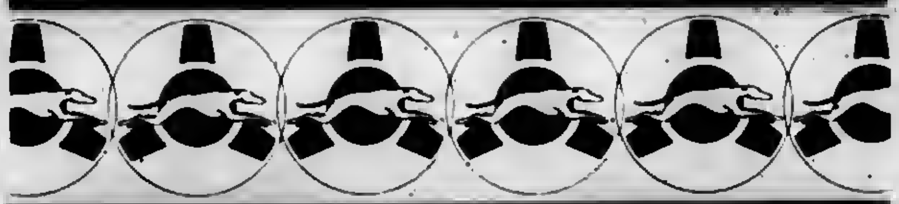

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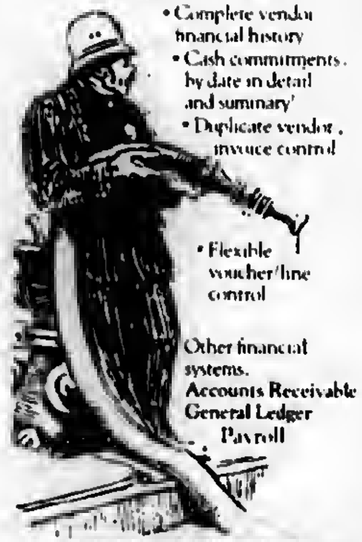

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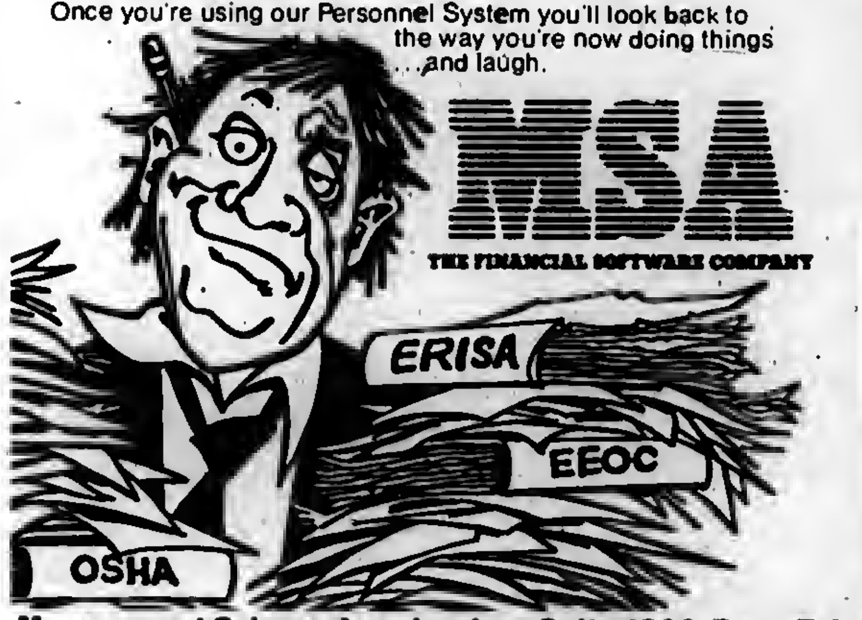

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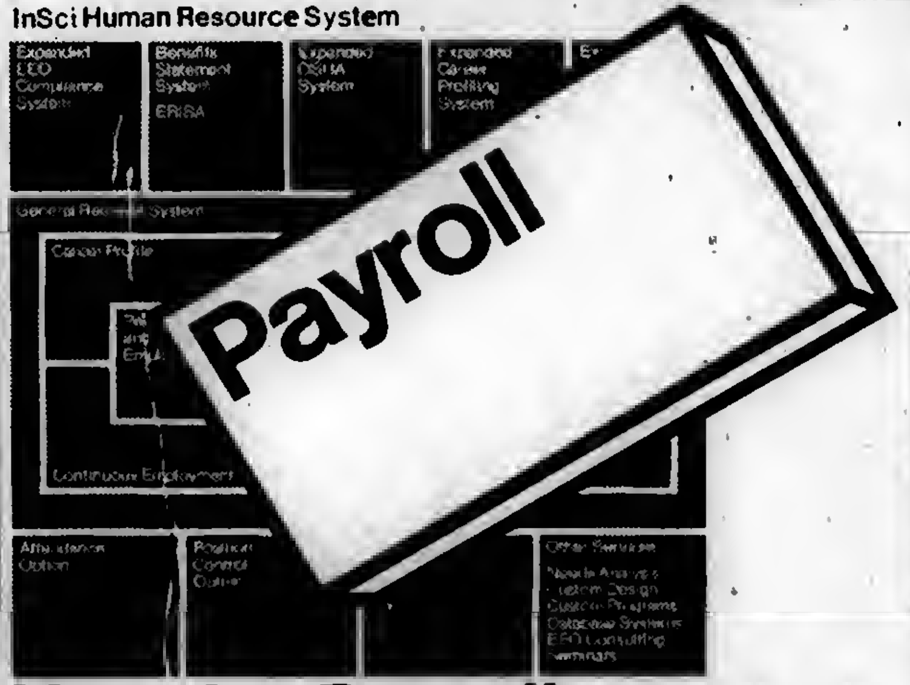

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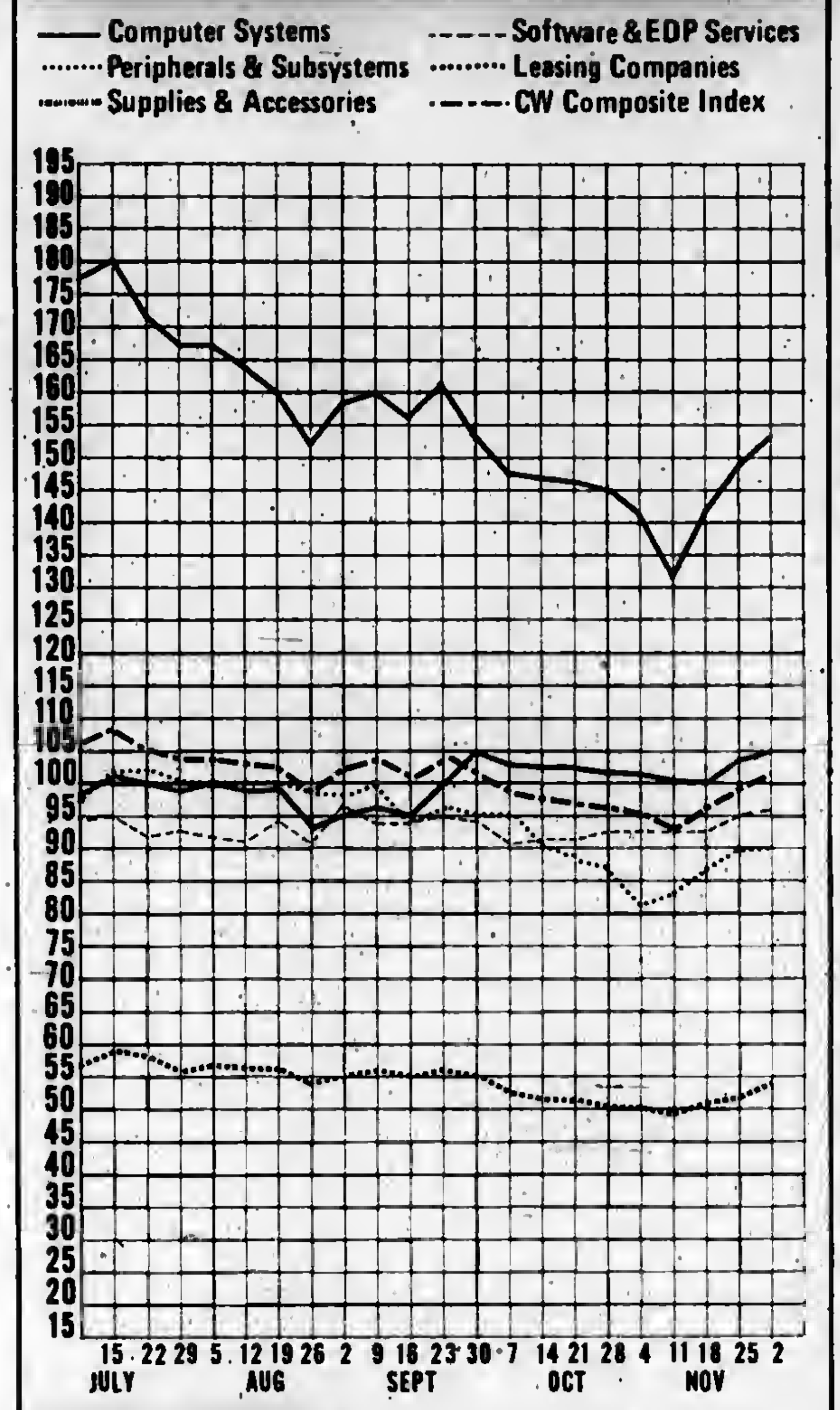

Earnings Reports

TEKTRONIX
Three Months Ended Aug. 21

	1976	1975
Shr Ernd	$.96	$.66
Revenue	89,543,000	74,858,000
Earnings	8,419,000	5,760,000

CONTROL DATA
Three Months Ended Sept. 30

	1976	a1975
Shr Ernd	$.87	$.53
Revenue	329,084,000	310,224,000
Tax Cred	350,000	100,000
Earnings	14,997,000	9,225,000
9 Mo Shr	2.12	1.73
Revenue	970,782,000	891,604,000
Tax Cred	600,000	300,000
Earnings	36,684,000	29,364,000

a-Restated.

CRAY RESEARCH
Three Months Ended Sept. 30

	1976	a1975
Loss	$415,000	.....
9 Mo Loss	995,000	.....

a-Company went public March 17, 1976.

DATA GENERAL
Year Ended Sept. 25

	1976	1975
Shr Ernd	$1.98	$1.51
Revenue	161,117,000	108,222,000
Earnings	18,948,000	12,851,000

FOUR-PHASE SYSTEMS
Three Months Ended Sept. 30

	1976	1975
Shr Ernd	$.57	$.66
Revenue	16,023,803	12,769,886
Tax Cred	945,000	281,000
Earnings	2,146,085	758,582
9 Mo Shr	2.46	1.24
Revenue	45,751,037	36,434,681
Tax Cred	2,281,000	579,000
Earnings	5,370,648	1,556,523

GENERAL INSTRUMENT
Three Months Ended Aug. 29

	1976	a1975
Shr Ernd	$.62	b$.40
Revenue	117,040,704	93,727,428
Disc Op	.....	(638,000)
Earnings	4,930,436	3,322,064
6 Mo Shr	1.01	b.60
Revenue	224,238,987	180,177,027
Disc Op	.....	(1,089,000)
Earnings	8,146,844	4,413,165

a-Restated. b-Adjusted for 2% stock dividend in May 1976.

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, DECEMBER 1, 1976

All statistics compiled, computed and formatted by
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COMPUTER SYSTEMS

EXCH		PRICE 1976 RANGE (1)	CLOSE DEC 1 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	AMDAHL CORP	23- 30	28	+ 3/8	+1.3
N	BURROUGHS CORP	84-108	90 3/8	- 7/8	-0.9
O	COMPUTER AUTOMATION	10- 19	16 1/4	- 1/2	-2.9
N	CONTROL DATA CORP	18- 27	22 7/8	- 1/4	-1.0
N	DATA GENERAL CORP	40- 60	47 1/2	+ 3/4	+1.6
O	DATAPOINT CORP	24- 46	30 1/2	+2	+7.0
O	DIGITAL COMP CONTROL	2- 7	6	+ 1/4	+4.3
N	DIGITAL EQUIPMENT	46- 60	56 1/2	+2 7/8	+5.3
N	ELECTRONIC ASSOC.	2- 5	2 1/8	+ 1/8	+6.2
A	ELECTRONIC ENGINEER.	7- 16	8 3/8	- 3/8	-4.2
O	FOUR-PHASE SYSTEMS	13- 21	15 7/8	+ 5/8	+4.0
N	FOXBORO	28- 50	47 7/8	-1 1/8	-2.2
O	GENERAL AUTOMATION	4- 11	5 1/2	+1	+22.2
O	GRI COMPUTER CORP	1- 1	1/2	0	0.0
N	HEWLETT-PACKARD CO	80-117	93 5/8	+4 5/8	+5.1
N	HONEYWELL INC	34- 56	44 1/2	+ 1/2	+1.1
N	IBM	227-288	272	+2 5/8	+0.9
O	MANAGEMENT ASSIST	1- 8	7 5/8	+ 1/4	+3.3
O	MEMOREX	17- 33	21 1/8	+ 3/8	+1.8
O	MICRODATA CORP	10- 28	16	+ 1/8	+0.7
O	MODULAR COMPUTER SYS	3- 14	4 1/2	- 1/4	-5.2
N	NCR	24- 37	35	+1 1/8	+3.3
O	PRIME COMPUTER INC	4- 18	17 3/4	+3 1/4	+22.4
N	PERKIN-ELMER	19- 27	20 3/4	- 1/8	-0.5
N	RAYTHEON CO	45- 67	59	-2 3/4	-4.4
N	SPERRY RAND	40- 52	44 1/2	0	0.0
O	SYCOR INC	9- 31	12 3/4	+ 3/4	+6.2
A	SYSTEMS ENG. LABS	5- 10	6 1/4	+ 1/8	+2.0
N	VARIAN ASSOCIATES	12- 17	14	+ 1/2	+3.7
A	WANG LABS.	11- 20	14 3/4	- 1/8	-0.8

LEASING COMPANIES

EXCH		PRICE 1976 RANGE (1)	CLOSE DEC 1 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	BOOTHE COMPUTER CORP	1- 8	7 3/8	+ 1/2	+7.2
O	COMDISCO INC	3- 10	9 1/4	- 1/4	-2.6
A	COMMERCE GROUP CORP	2- 3	1 5/8	- 1/8	-7.1
A	COMPUTER INVSTRS GRP	1- 3	1 3/8	0	0.0
N	DATRONIC RENTAL	1- 8	1 1/8	- 1/8	-10.0
A	DCL INC	1- 1	5/8	+	+10.0
N	DPF INC	5- 8	6 5/8	0	0.0
N	ITEL	6- 15	12 5/8	- 1/8	-0.9
N	LEASCO CORP	6- 20	20	+1 7/8	+10.3
O	LEASPAC CORP	0- 1	1/8	0	0.0
O	NRG INC	0- 1	1/8	0	0.0
A	PIONEER TEX CORP	6- 9	7 3/4	+ 1/4	+3.3
N	U.S. LEASING	7- 12	8 1/4	- 5/8	-7.0

SOFTWARE & EDP SERVICES

EXCH		PRICE 1976 RANGE (1)	CLOSE DEC 1 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 3	1 1/8	0	0.0
O	ANACOMP INC	6- 11	6 5/8	- 1/8	-1.8
A	APPLIED DATA RES.	2- 5	4 1/2	+ 5/8	+16.1
N	AUTOMATIC DATA PROC	17- 35	30	+ 1/2	+1.6
O	COLEMAN AMERICAN COS	2- 6	2 1/4	- 1/8	-5.2
O	COMPU-SERV NETWORK	3- 10	8 1/4	+ 1/4	+3.1
O	COMPUTER DIMENSIONS	3- 7	6 1/4	0	0.0
O	COMP ELECTION SYSTMS	5- 9	5 1/4	+ 1/4	+5.0
O	COMPUTER HORIZONS	1- 2	1 1/2	- 1/4	-14.2
O	COMPUTER NETWORK	2- 8	7	- 1/4	-3.4
N	COMPUTER SCIENCES	4- 8	6 1/2	+ 3/8	+6.1
O	COMPUTER TASK GROUP	1- 2	1 1/4	0	0.0
O	COMPUTER USAGE	3- 6	2 1/2	- 1/8	-4.7
O	COMSHARE	2- 9	6	0	0.0
O	DATA DIMENSIONS INC	2- 4	3 5/8	+ 5/8	+20.8
O	DATATAB	1- 2	1 1/2	0	0.0
N	ELECTRONIC DATA SYS.	12- 18	16 3/4	+1 3/8	+8.9
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	INSYTE CORP	1- 3	1 1/2	0	0.0
O	IPS COMPUTER MARKET.	1- 2	1	- 1/8	-11.1
O	KEANE ASSOCIATES	2- 4	2 1/8	- 5/8	-22.7
O	KEYDATA CORP	1- 5	1 1/4	- 1/2	-28.5
O	LOGICON	3- 7	7 1/8	+1 3/4	+32.5
A	MANAGEMENT DATA	1- 3	2	0	0.0
A	NATIONAL CSS INC	13- 25	19 7/8	+ 1/4	+1.2
O	NATIONAL DATA CORP	4- 7	4 7/8	0	0.0
A	ON LINE SYSTEMS INC	17- 22	20 3/8	+ 1/8	+0.6
N	PLANNING RESEARCH	3- 5	3 1/2	0	0.0
O	PROGRAMMING & SYS	1- 1	1/4	0	0.0
O	RAPIDATA INC	2- 5	1 3/4	0	0.0
O	REYNOLDS & REYNOLDS	13- 21	16 1/4	+ 1/2	+3.1
O	SCIENTIFIC COMPUTERS	1- 1	3/4	- 1/8	-14.2
O	TYMSHARE INC	14- 29	17	+ 1/2	+3.0
A	URS SYSTEMS	3- 5	3 1/2	0	0.0
N	WYLY CORP	1- 7	1 1/4	+ 1/8	+11.1

PERIPHERALS & SUBSYSTEMS

EXCH		PRICE 1976 RANGE (1)	CLOSE DEC 1 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	8- 13	10 5/8	+ 1/2	+4.9
O	ADVANCED MEMORY SYS	4- 10	6	0	0.0
N	AMPEX CORP	5- 10	6 5/8	+ 1/4	+3.9
O	ANDERSON JACOBSON	2- 4	2 7/8	0	0.0
O	APPLIED DIG DATA SYS	13- 25	16	0	0.0
O	BEEHIVE MEDICAL ELEC	3- 9	8 5/8	+ 1/8	+1.4
A	BOLT,BERANEK & NEW	7- 11	7 1/2	- 3/8	-4.7
N	BUNKER-RAMO	5- 10	7 1/4	+ 1/4	+3.5
A	CALCOMP	4- 7	4 1/2	- 1/8	-2.7
O	CAMBRIDGE MEMORIES	0- 6	1/2	0	0.0
N	CENTRONICS DATA COMP	20- 36	25	+1 7/8	+8.1
O	CODEX CORP	22- 42	30 1/2	+1	+3.3
O	COGNITRONICS	1- 1	7/8	+ 3/8	+75.0
O	COMPUTER COMMUN.	1- 8	4 5/8	- 1/8	-2.6
O	COMPUTER CONSOLES	4- 7	5	+ 1/4	+5.2
A	COMPUTER EQUIPMENT	1- 3	1 3/4	- 1/8	-6.6
O	COMPUTER TRANSCEIVER	1- 3	7/8	0	0.0
O	COMTEN	4- 9	8 1/2	+ 1/2	+6.2
N	CONRAC CORP	20- 25	23	+1 1/8	+5.1
O	DATA ACCESS SYSTEMS	1- 5	5	0	0.0
O	DATA 100	6- 13	6 7/8	+ 1/8	+1.8
A	DATA PRODUCTS CORP	5- 15	11 1/4	+ 1/8	+1.1
O	DATA TECHNOLOGY	1- 2	2	+ 1/8	+6.6
O	DATUM INC	1- 2	7/8	+ 1/8	+16.6
O	DECISION DATA COMPUT	1- 4	1 3/4	+ 1/4	+16.6
O	DELTA DATA SYSTEMS	1- 1	1/2	0	0.0
N	ELECTRONIC M & M	1- 4	3 1/4	+ 3/8	+13.0
O	FABRI-TEK	1- 1	7/8	0	0.0
O	GENERAL COMPUTER SYS	0- 2	3/8	0	0.0
N	HAZELTINE CORP	4- 12	8 1/2	- 1/4	-2.8
N	HARRIS CORP	34- 55	53 1/2	- 3/8	-0.6
A	INCOTERM CORP	9- 20	13 3/4	+2 1/8	+18.2
O	INFOREX INC	3- 7	4 3/8	- 1/8	-2.7
O	INFORMATION INTL INC	10- 18	11 5/8	- 1/2	-4.1
O	INTEL CORP	47-109	59	+5 1/2	+10.2
A	LUNDY ELECTRONICS	3- 7	3 7/8	0	0.0
O	MSI DATA CORP	3- 7	6	- 1/8	-2.0
A	MILGO ELECTRONICS	15- 22	20 1/2	0	0.0
N	MOHAWK DATA SCI	3- 10	5 3/8	- 1/2	-8.5
O	PENRIL CORP	1- 3	1 7/8	+ 1/8	+7.1
A	PERTEC CORP	3- 8	6 1/2	- 1/8	-1.8
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	2- 10	2	0	0.0
O	QUANTOR CORP	4- 6	5 1/4	+ 3/4	+16.6
O	RECOGNITION EQUIP	6- 11	9 1/8	+ 1/8	+1.3
N	SANDERS ASSOCIATES	6- 11	8 3/8	- 1/8	-1.4
O	SCAN DATA	1- 4	1 1/8	-	-4.9
O	STORAGE TECHNOLOGY	9- 13	11	+ 1/2	+4.7
O	T BAR INC	5- 10	6 1/4	0	0.0
O	TALLY CORP.	4- 6	5 1/4	- 1/4	-4.5
O	TEC INC	3- 8	7 1/2	+1	+15.3
N	TEKTRONIX INC	45- 69	63 1/2	+1 1/8	+1.8
N	TELEX	2- 5	2 5/8	+ 3/8	+16.6
O	WANGCO INC	11- 22	21 1/8	0	0.0
O	WILTEK INC	2- 2	1 1/4	- 1/4	-18.6

SUPPLIES & ACCESSORIES

EXCH		PRICE 1976 RANGE (1)	CLOSE DEC 1 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED SYSTEMS INC	1- 4	3 3/8	0	0.0
O	BALTIMORE BUS FORMS	3- 5	3 1/2	- 1/8	-3.4
A	BARRY WRIGHT	6- 10	9 3/8	+ 3/8	+4.1
O	CYBERMATICS INC	0- 1	1/2	+	+14.1
A	DATA DOCUMENTS	25- 45	42 1/4	-3	-6.6
O	DUPLEX PRODUCTS INC	13- 24	12 7/8	+ 1/8	+0.9
N	ENNIS BUS. FORMS	6- 8	6	+ 1/4	+4.3
O	GRAHAM MAGNETICS	8- 13	11 1/4	+ 3/4	+7.1
O	GRAPHIC CONTROLS	13- 19	15 1/2	- 3/4	-4.6
N	3M COMPANY	53- 86	56 1/4	-2 1/4	-3.8
O	MOORE CORP LTD	32- 51	33 1/2	- 1/4	-0.7
N	NASHUA CORP	11- 19	18	+ 5/8	+3.5
O	STANDARD REGISTER	15- 19	17 1/4	- 1/4	-1.4
O	TAB PRODUCTS CO	5- 11	9 1/2	+ 1/2	+5.5
N	UARCO	19- 25	19 3/8	- 1/8	-0.6
A	WABASH MAGNETICS	4- 11	11 1/8	+ 7/8	+8.5
N	WALLACE BUS FORMS	19- 25	21 7/8	- 1/4	-1.1

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News Round-Up

CCPA Again OKs Program Patent

By Don Leavitt
Of the CW Staff

WASHINGTON, D.C. — In a 3-2 decision, the U.S. Court of Customs and Patent Appeals (CCPA) again reversed the U.S. Patent Office and ruled software is eligible for protection as an invention under existing law.

The decision last month covered the "Regulator" program invented by Glen F. Chatfield, president of Duquesne Systems, Inc. of Pittsburgh. Regulator monitors and modifies the flow of user programs in a multiprogramming environment through dynamic changes in program priority assignments.

The Patent Office has 90 days to appeal the finding to the U.S. Supreme Court, but it has not yet decided what action it will take, Solicitor Joseph F. Nakamura indicated last week.

Although not directly related to the case, the transition from a Ford to a Carter administration may nonetheless affect both what the Patent Office does and when it acts, according to one observer. The Commissioner of Patents is a political appointee and the current commissioner is therefore a "lame duck," he explained.

In the majority opinion on the Chatfield case, CCPA Chief Judge Harold T. Markey recalled precedents, including the Benson-Tabbot case in 1972 and the Johnston case earlier this year [CW, April 5] in which the Supreme Court heard appeals from the Patent Office and upset CCPA findings in favor of software inventors.

(Continued on Page 4)

U.S. Slashing IBM Witness List

By Catherine Arnst
Of the CW Staff

NEW YORK — The finish line is in sight for presentation of the government's antitrust case against IBM here — a job which has taken approximately 154 court days so far.

Government attorneys, "apparently satisfied they have put a very strong case into the record," have begun to slash their witness list, a Justice Department source said.

With the cuts made to date, a June 1977 conclusion seems plausible, he added.

The government's original witness list, submitted to the court on Sept. 19, 1975, contained 107 names. On July 15, 1976 — nearly 10 months later — only 31 of those had testified and some observers were projecting the Justice Department would take two or three more years to get through the entire list.

However, the pace of the trial changed considerably after July. Until then, the court had been sitting four hours per day, four days per week and most of that time was filled with documents heing read into the record.

In September, the court shifted to five hours per day, five days per

(Continued on Page 3)

Government Modeling Efforts Hit

By E. Drake Lundell Jr.
Of the CW Staff

WASHINGTON, D.C. — Lack of management planning, commitment and control is costing the U.S. taxpayers millions of dollars in unnecessary development costs for computer models used by the government, according to a recent General Accounting Office (GAO) report.

"Although successfully developed models can be of assistance in the management of federal programs, GAO found that many model development efforts experienced large cost overruns, prolonged delays in completion and total user dissatisfaction with the information obtained from the model," the report concluded.

At the same time, however, the GAO said "a minor investment" in the development of guidelines and standards for such systems "could save the government millions of dollars in model development costs and make modeling a more efficient and effective tool for managing federal

(Continued on Page 5)

Despite Antitrust Action

Carter Eyeing IBMers for Cabinet

By E. Drake Lundell Jr.
Of the CW Staff

PLAINS, Ga. — As the slow and deliberate Cabinet selection process continues here, it appears likely a significant part of the incoming Administration will be drawn from a group of people with close ties to IBM — even while the government continues to prosecute an antitrust suit against the firm.

It now looks as though three or possibly four Cabinet posts in the Carter Administration will be filled hy those with IBM links. And they are some of the most important — State, Defense and Commerce.

In addition, President-elect Jimmy Carter's top science and technology advisor is drawn from the ranks of IBM.

Furthermore, much of Carter's input from the business community is coming from those with close IBM ties.

Cyrus Vance, named two weeks ago to be Secretary of State, is a member of the IBM board of directors.

Harold Brown, president of the California Institute of Technology, is the front runner for the position of Secretary of Defense. He is also an IBM director.

Jane Cahill Pfeiffer, interviewed here last week for the Commerce Secretary's slot, is a former vice-president for communications at IBM and is married to Ralph A. Pfeiffer Jr., presently senior vice-president at IBM.

Another IBM director being considered for a Cabinet slot is Patricia R. Harris, a black lawyer. Her name has not been mentioned for any specific post, but it keeps popping up in the discussions on the staffing of the new Administration.

Dr. Lewis M. Branscomb is said to have the President-elect's ear on science and technology and may wind up as the science adviser to the President when he takes office on Jan. 20. Branscomb is an IBM vice-president and chief scientist for the firm.

Carter Meets With Cary

The Carter business adviser most connected with IBM is Frank T. Cary, IBM chairman of the board, who met with the President-elect in Washington, D.C., last week.

In addition to Cary, Irving S. Shapiro, chairman of E.I. du Pont de Nemours & Co., has been giving Carter advice on business matters. He is also a member of the IBM board of directors.

For years IBM brass has pursued a policy of supporting both Republican and Democratic candidates for President, but it appears the payoff could be greater from this election than from any before — with the possible exception of the election of Dwight Eisenhower in 1952.

One of Eisenhower's greatest supporters was Thomas Watson Sr., then chairman of IBM, who helped land the presidency of Columbia University for the ex-general and who then supported his Presidential campaign.

In 1954 the Justice Department negotiated what was seen by many as a weak consent decree in an antitrust suit filed against the firm by the outgoing Truman Administra-

(Continued on Page 6)

Diffused Power to Scatter DP Responsibility: Glaser

By Ronald A. Frank
Of the CW Staff

HILTON HEAD, S.C. — Distributed data processing will significantly change the way non-DP persons operate within a corporation, according to consultant George Glaser.

Speaking at a conference on distributed DP held by International Data Corp. here last week, Glaser said DP managers must be prepared to decentralize the DP management functions along with the hardware.

"I doubt any organization can limit its venture into distributed DP to hardware only. Once the hardware is in the hands of the users and they become accustomed to having it available, they will want still more devices, more processing power and more staff," he predicted.

DPers Must Adjust

The cost of such "organizational dislocations" will be high, and the DPers who cannot adjust "will fall beneath the wheels of progress," he said.

The intelligent DP manager knows distributed DP will diminish his influence; for this reason, a company cannot rely only on DPers in making the decision on whether to decentralize, he cautioned.

The trade-off is between centralization — which means order — and decentralization — which means freedom, he said, adding the solution will be a balance between the two.

It is to be expected that the pendulum will swing back and forth as the various benefits are considered, Glaser said.

Distributed DP will put computing power into the hands of those who have the problems to solve. As a result, needs should he assessed more realistically and costs should be under more visible control, Glaser said.

However, there are disadvantages, he warned. Among them are technical problems.

The configuration of distributed systems "will challenge the skills of even the most experienced or-

(Continued on Page 3)

Ex-HEW Official Charged With Writing MMIS Bids

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. — One of three federal officials responsible for reviewing and certifying state plans for automated Medicaid systems allegedly accepted more than $8,000 in checks and services from a contractor of those systems, the Senate Subcommittee on Investigations learned here recently.

Charles A. Cubbler received the money and a 1975 Chrysler Cordoba from FMS Management Services, Inc. for writing and editing proposals for Medicaid Management Information Systems (MMIS), staff investigators told the subcommittee.

Cubbler, acting director of Medicaid systems in the Department of Health, Education and Welfare's (HEW) Office of Information Systems (OIS) from Aug. 8, 1974 until April 21, 1975, then participated in the federal decision-making process that resulted in contract awards to FMS in West Virginia and Maryland, the investigators said.

The MMIS program, which costs taxpayers $1.5 billion annually, will probably provide the foundation for the processing system needed for any type of national health insurance program [CW, Nov. 29].

The report on Cubbler's activities was part of an overall review of the MMIS program being conducted by subcommittee investigators David Vienna and Walter S. Fialkewicz.

HEW is also looking into "possible irregularities" in Cubbler's actions, a spokesman there said. HEW's investigation is being conducted "in consulta-

(Continued on Page 4)

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Suit Charges Federal Commission Fails To Protect Trade Secrets Held on Tape

By Catherine Arnst
Of the CW Staff

WASHINGTON, D.C. — The U.S. Consumer Product Safety Commission (CPSC) gives insufficient protection to manufacturers' trade secrets it stores on computer tape, a suit filed here has charged.

The Chemical Specialist Manufacturers Association, Inc. (CSMA) brought the action after the commission turned information on manufacturers' formulas over to Auerbach Corp. for processing and storing on computer tape.

CSMA has complained the commission had no internal security regulations to safeguard this information and, more seriously, had no regulations on the security responsibilities of outside contractors, according to Steven Kellner, director of legislative and regulatory affairs for the CPSC.

CPSC requires manufacturers to turn over product formulas as part of its work to protect consumers from harmful materials.

The association wants CPSC to publish regulations in the *Federal Register* and then allow time for comments on them. In a pretrial hearing, Judge Bennington Parker expressed displeasure with the commission for failing to follow that procedure.

Since then, the agency has published regulations it claimed already existed in unwritten form in the *Federal Register*, but no time was allowed for comments, Kellner said.

'Woefully Inadequate'

The deposition of a consultant, Eric Novotny, was introduced by CSMA as expert testimony. Novotny said he looked at several documents used by CPSC for security purposes and found the procedures "woefully inadequate."

Some of the language was unclear and security controls on outside contractors weren't as stringent, he said. "An audit trail cannot detect the damage because the information does not have to be tampered with," he explained.

But the CPSC believes the Federal Criminal Code is adequate protection since it prohibits employees from disclosing this information, according to Edward Cull, general counsel for the commission.

There have been no accusations of breaches of security since the commission obtained the trade secrets, which is proof the regulations now in use are adequate, Cull claimed.

Auerbach already has top secret clearance from the Department of Defense and the firm's physical plant was visited by CPSC members to ensure it met security standards, he added. Also, CPSC required any persons coming in contact with the data to sign affidavits on their background.

Auerbach had the trade secret information for 16 months; during that time it was processed and stored on computer tapes that have since been returned to CPSC.

Those tapes are tightly guarded and the whole set must be obtained by anyone who wants the information contained on them; one tape by itself is useless, Cull said.

Even though no breaches of security have been discovered, that doesn't mean they haven't or won't occur, Novotny said. "There are as many if not more motives there than financial embezzling. An individual could divulge the trade secrets for moral reasons because he does not approve of a product," he said.

Both sides have filed motions for summary judgment — a request that the judge rule on the facts of the case without a trial. Kellner expects a hearing on those motions soon and thinks Parker will make a summary judgment, he said.

Users Rebuked for Not Assessing Costs of Installed Applications

By Ronald A. Frank
Of the CW Staff

HILTON HEAD, S.C. — Only one in 10 users today is evaluating the cost benefits achieved by a DP application after it is implemented, according to John F. Rockart, director of the Sloan School Center for Information Systems and Research at MIT.

Rockart told a conference on distributed data processing here last week that increased project evaluation is needed to keep track of the cost benefits actually obtained from applications.

As distributed DP takes hold, it will be more difficult to perform this type of evaluation because of the dispersed locations involved. But many of the centralized vs. decentralized trade-offs must be made in relation to the DP pricing involved, Rockart said.

Most systems are built today "from the transaction up," he pointed out, but there is an alternative which is based on configuring DP needs from the management decision down.

The latter "decision support" approach would apply to such applications as cash management and portfolio management, he said.

Three major trends are currently being seen among major DP implementations, depending on their requirements. These are centralization toward one large site, which is being done by Martin Marietta and others; decentralization to dispersed sites; and a return to a more centralized DP operation from a heavily decentralized operation.

In the third category Rockart listed such firms as Du Pont and Corning Glass.

Stressing there is no one correct way for a DP implementation to go, Rockart said the proper solution must be based on application analysis and especially the implication of that approach to DP management. In many cases, the cost segment of the decision is based on software creation and management because the cost of hardware is no longer a prohibitive factor.

Certain types of applications appear to lend themselves to operational patterns, he added. Accounting tends to be run with both centralized software and hardware; order entry often has centralized software which is run on decentralized hardware.

In manufacturing, both hardware and software tend to be decentralized, Rockart said.

As a general rule, most batch-oriented applications are centralized while on-line jobs are run in decentralized mode, he noted.

The trend toward more hardware decentralization is based on increased process control types of applications in which a remote processor gathers data and builds a local (remote) data base where the data is being monitored, Rockart said.

Other reasons for this decentralization are lower cost hardware, increased on-line applications and decision support-type systems where data is collected to support management in taking specific actions, he added.

Correction

In the story on the U.S. vs. IBM antitrust trial's journey to Miami [CW, Dec. 6], the IBM attorney should have been identified as Robert Mullen and the Justice Department attorney as Charles Hamilton III.

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FCC Will Play Part in AT&T Antitrust Trial: Judge

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. — Federal Judge Joseph C. Waddy and the Federal Communications Commission (FCC) will try the U.S. government's antitrust suit against AT&T hand in hand.

Stifled by jurisdictional questions within three months after its filing in November 1974, U.S. vs. AT&T began moving forward again when Waddy ruled from the bench last month that the U.S. District Court here does have the right to hear the case [CW, Nov. 22].

In a later written opinion clarifying his oral ruling on why the FCC, as Bell's regulator, shouldn't hear the Justice Department complaint, the judge said AT&T and its codefendants in the suit "do not have blanket immunity from antitrust liability" even if they are regulated under a "pervasive" scheme established by Congress with the Federal Communications Act of 1934.

Antitrust Jurisdiction

The antitrust laws still can be applied to the telephone company, Waddy maintained in his memorandum. "The court is satisfied that it has antitrust jurisdiction of at least some of the aspects of the case," he said.

At the same time, he conceded that "some — or much — of the conduct and practices" of AT&T on which the Justice Department bases its telecommunications industry monopoly charges might well fall under the watchful eye of the FCC.

"The court, in its discretion, will in the future consider referring particular issues to the commission at the appropriate time," he said.

Justice Complaint 'Vague'

In addition, at this stage of the suit's journey to trial, "the issues must be more sharply defined" through exchanges of documents, interviews with prospective witnesses and other procedures permitted under federal rules for civil cases, the judge noted.

The court agreed with AT&T that the Justice Department complaint is "vague," but added its failure to describe specific acts that support the contention that AT&T is a monopolist doesn't warrant dismissal of the case.

Justice Slashes Witness Roster

(Continued from Page 1)

week and documents were entered into the record without being read in the open court. This change in procedure almost doubled the speed at which attorneys could present their case.

Evidence of the accelerated pace can be found in the transcript page count. On July 15, 1976, after 14 months of trial, there were 22,319 transcript pages. Four months later, on Nov. 15, the count stood at 32,449.

In August, the government presented an updated witness list containing 60 names to the court. Although only four of those witnesses have testified, the list has been cut by approximately 24 names.

Thirteen witnesses were deleted in the financial portion of the government's presentation while the testimony of several other witnesses has been stipulated to by both parties.

In addition, 11 government personnel who helped prepare the case may be called to the stand if IBM requests it. No decision has been reached on that matter yet.

As the case stands now, three Memorex Corp. witnesses will appear next: Laurence Spitters, former president and chairman of the board; John Navas II, manager of resource planning; and Thomas E. Gardner, disk subsystem development manager.

They will be followed by witnesses from Storage Technology Corp., California Computer Products, Inc. (Calcomp), Cambridge Memories, Wang Laboratories and Advanced Memory Systems.

The court still must plow through a considerable number of documents — more than 500 will be offered in the peripherals case alone, according to government estimates.

In addition, decisions must be made on about 1,000 claims of privilege made by IBM.

Nevertheless, government attorneys are confident they will be able to tie up all these loose ends by June and some are even predicting a closing date in May.

Glaser Sees Diffusion Of DP Responsibility

(Continued from Page 1)

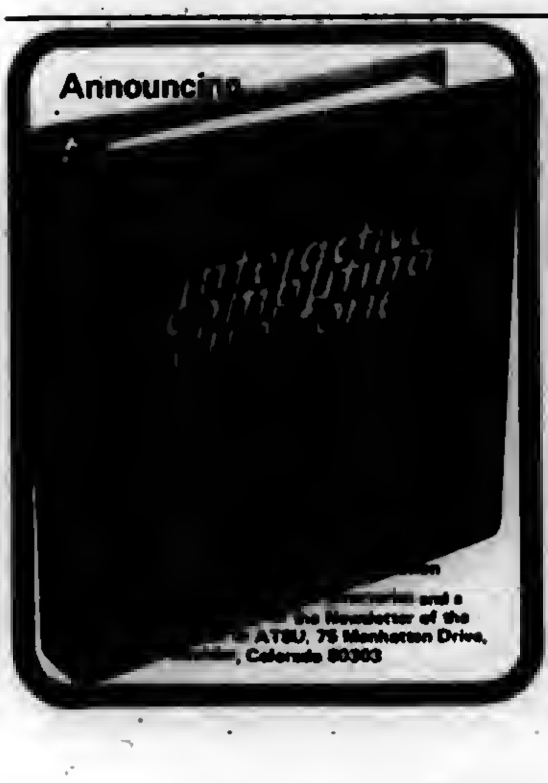
ganizational designers. And some technical specialists will leave due to the diminished role they will play," Glaser said.

Not all firms should adopt decentralized DP, but if a company operates under a management philosophy that encourages dispersed responsibilities, it should also consider distributing DP, he said.

Classic problems such as security, privacy and career paths will all become more complex when distributed DP concepts are adopted, Glaser warned. As long as the system fits the needs of the company, it may be worth the extra effort, he said.

With decentralization, CPU utilization will go down. There also will be some duplication of effort as local staffs grow in size and cost and the influence of the corporate DP staff diminishes.

"But I'm willing to accept all of these results to make it easier for those who have the problems to get their hands on the tools to solve them," he said.



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Ex-HEW Official Cited for Writing Firm's MMIS Bids

(Continued from Page 1)

tion" with the Department of Justice.

Cubbler's attorney, George Frampton of Rogovin, Stern and Huge here, said Cubbler doesn't think it would be appropriate to comment on the substance of the subcommittee hearings at this time. However, the former HEW official may testify on the matter if called upon, Frampton said.

In their presentation to Sen. Sam Nunn and his subcommittee, Vienna and Fialkewicz also voiced fears that contracts for MMIS, which receive 90% federal funding for system design, development and installation if approved and 75% for operating expenses if certified, aren't competitive enough.

Francis J. Melly, president of FMS, told the investigators "that Cubbler wrote parts of and 'edited' FMS's West Virginia proposal and that he simply edited the Maryland proposal," they said.

HEW records show that at the same time, Cubbler was one of three certifying officials responsible for approving systems slated to receive 90% of their development costs from the government.

While Cubbler was not the only person involved in the decision to award FMS with a $460,270 contract for the West Virginia MMIS, he was the only advocate of a $133,890 supplement to that contract, the investigators said.

The supplement to the contract between West Virginia and FMS was approved over the objections of OIS officials and staff, the investigators stated. Many objected to this supplement because it would duplicate federal funding of systems work on the evaluation and tracking of nursing homes and their utilization already under way in Utah.

"Cubbler was in a position to know exactly what HEW would want to see in any proposals that would be approved. Indeed, it was his job as a government employee to tell states what HEW expected," the investigators said.

FMS' Melly told the subcommittee various payments were made to Cubbler for consulting services in connection with the West Virginia, Maryland and Civilian Health and Medical Program for Uniformed Services (Champus) requests for MMIS bids.

The dates of these checks are interspersed with those of conferences for companies which wanted to bid on the West Virginia job and later on the $299,800 Maryland contract. The stubs in Melly's checkbook indicate "D.C. Chambless" — Cubbler's wife's maiden name — was paid for "West Virginia professional fee," "Maryland proposal," and "consulting services Champus proposal," the investigators reported.

Shortly before FMS received the extension on its West Virginia contract and months before it acquired the Maryland job, FMS gave Cubbler a Chrysler Cordoba for his personal use. The car was to serve FMS in the event the company opened a Washington office to serve the Champus program, according to Melly.

FMS was not awarded this contract, however. The Washington office idea was dropped and Cubbler simply was allowed to keep the car, Melly told the subcommittee investigators.

Concern Over Texas

In addition to its concern that contracts for MMIS aren't sufficiently competitive, the Senate Subcommittee on Investigations is examining certification of "fragmented" or multiple computer systems to handle Medicaid claims processing in a state. Duplicate systems duplicate federal costs,

HEW recently certified such a system in Texas, however, and Cubbler, then detailed to the OIS' Office of Systems Planning and Evaluation, appears to have had a hand in the process, the investigators reported. Exactly what that role was is uncertain, they told the subcommittee.

Attorneys for Melly informed the Senate subcommittee staff that Cubbler advised FMS of the subcommittee inquiry perhaps as early as last March, the investigators said.

"Melly told the subcommittee staff that Cubbler told him to destroy all checks the company had paid him and that Cubbler directed Melly to change all expense vouchers for entertainment by deleting his — Cubbler's — name," they told the subcommittee.

"Melly did not destroy the checks but did ask his Washington representative to send in amended expense vouchers," the investigators reported.

"When the subcommittee subpoena was served in July on Melly, he surrendered the checks and the actual, unamended expense vouchers. Subsequently, in an expression of good faith and cooperation with the subcommittee inquiry, Melly, through his attorneys, revealed the Cubbler directives and he provided to the subcommittee the altered expense vouchers with names substituted for Cubbler's name," they said.

CCPA Reverses Patent Decision

(Continued from Page 1)

In the former case, the high court limited its decision to the algorithm invented by Benson and Tabbot rather than encompassing all software, Markey said. The narrow nature of that decision was reemphasized by the Supreme Court when it threw out the Johnston claim on the grounds of obviousness and specifically refused to rule on the general patentability of computer programs, he added.

In the Chatfield situation, "no prior art was cited [by the Patent Office] against the appealed claims and, accordingly, [the] invention must be considered to have been new and unobvious," the judge continued, clearing that challenge.

"Although Chatfield's method of operating a computing system adjusts priorities of computer programs, no processing program, by itself, is claimed," he said.

Because any algorithms used in Chatfield's method "only guide the flow" and do not change the logic of programs being executed, "the issue is not whether a computer processing program, claimed in 'method' terms," is patentable under current law, Markey added.

Defined as a "method of operating a computer system," Chatfield's invention falls within the scope of the Patent Act which allows "process" claims; "method" and "process" have been deemed synonymous in earlier court rulings, he noted.

In particular, he added, the claim is not based on "mathematical problem-solving algorithhms" or on "purely mental steps," either of which would make it ineligible for patent protection.

Chatfield's application listed some algorithms which may be used in carrying out intermediate steps in his process. Although these might seem to fall in the prohibited area, "no formula or algorithm appears in the inventor's primary claim."

Therefore, Markey ruled, the invention, taken as a whole, is patentable.

In a dissenting opinion, CCPA Judge Giles S. Rich argued against the narrow interpretation of the Benson-Tabbot decision. Clearly upset with the ambiguities in that 1972 ruling, he noted the Supreme Court stated at the outset of its opinion that "the question is whether the method described and claimed is a 'process' within the meaning of the Patent Act.

"But nowhere in the Benson opinion have I ever, after many attempts, been able to find an express answer to that question . . . therefore I have turned to the . . . contentions that we erred in holding [those] claims" patentable, Rich said.

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Says Private Sector Could Do Better Job

OTP's Houser Believes 'Fed' Shouldn't Control EFT

By E. Drake Lundell Jr.
Of the CW Staff

NEW YORK — The Federal Reserve System should neither dominate nor control the developing national electronic funds transfer (EFT) system, Thomas J. Houser, director of the White House Office of Telecommunications Policy (OTP), told the American Bankers Association meeting here recently.

"There are reasons for believing private organizations can carry out all the transmission functions of the Federal Reserve payments system and do the job with reliability, security and at a lower cost," Houser said.

But "the Federal Reserve continues to expand its operational role in interbank EFT" in spite of previous objections by the OTP and others, Houser noted.

Presently, the Federal Reserve has instituted "pilot projects" linking various automated clearinghouses, he said.

"We are told this is an 'evolutionary' step, but the end point of the evolution appears to leave the Federal Reserve dominating all payments activities in the economy," Houser claimed.

While the Federal Reserve "needs to know about the net activity of the U.S. payment system," Houser said this "is definitely not a sufficient reason for ownership and control of the facilities at an artificial heart of the system."

'Cause for Concern'

There is "cause for concern" when officials of the Federal Reserve "pledge willingness" to comply with possible recommendations of the National Commission on EFT while, "in the interim, the back offices of the Reserve banks and the Reserve system continue to design and implement EFT systems" which are not sanctioned by the national commission, Houser warned.

"If we wish to ensure the robustness of a transaction system, then we do so by [the] decentralization and designed-in redundancy" that comes with privately run systems, he contended.

"As we race to automate and 'rationalize,' it is worth reflecting upon the healthy distrust of a big centralized system which has given us over 14,000 banks today and the strongest — but not most convenient — financial system in the world," he added.

"To the vast majority of Americans, big centralized systems mean either New York or Washington and a continual erosion of localism and individuality," he said.

Federal Modeling Efforts Hit

(Continued from Page 1)

programs."

"Although the government's total investment in computerized models cannot be determined," according to the report, it is clearly in the hundreds of millions of dollars. The Defense Department alone spent more than $172 million on such models in 1970, the GAO said.

In order to study the problem, the GAO identified 538 federal agencies or contractors in the Pacific Northwest area of the U.S. using 519 computer models that cost about $39 million to develop. It looked in detail at 57 models that cost $21 million in development.

Lack of governmentwide standards and guidance for developing such models "was a factor directly contributing to the large problems experienced while developing 33 of these models," the GAO said.

"These problems resulted in cost overruns, delays in developing the models and user dissatisfaction with the information produced by the model," the agency added.

"Cost overruns totaled about $1.1 million to make some models responsive to user needs. Some development cycles were delayed up to four years beyond their original and revised completion dates.

"In some instances managers would not use the information obtained from the model because they were displeased with its reliability. The cost to develop those unsatisfactory models totaled about $1.6 million," the report stated.

Problem Causes

All of the problems were attributable to lack of either management planning, management commitment or management coordination, according to the GAO.

In the area of planning, the congressional watchdog agency said:

- "Management did not clearly define the problem to be modeled; thus, the developer had to guess what had to be modeled."
- "The developer was not able to obtain the data needed to make the model function."
- "Management allocated insufficient funds to complete the model."
- "Management did not make workable provisions for updating the model for future use; thus, the model soon began to provide outdated information."
- "Management did not make provisions for evaluating the model."
- "Management did not clarify documentation requirements for the model. As a result, only the developer understood how it worked and the relationships maintained by the variables incorporated into it."

A lack of management commitment was evidenced by the fact management did not actively participate in planning models and by the fact management did not understand the techniques and applications of computer modeling.

Furthermore, lack of coordination was shown in many cases when management did not monitor the model development effort on a continuous basis, allowing efforts to continue after they should have been terminated, the GAO said.

In order to overcome the problems encountered with the models, the GAO called on the Secretary of Commerce to "formulate" governmentwide standards pertaining to development and procurement of computerized models."

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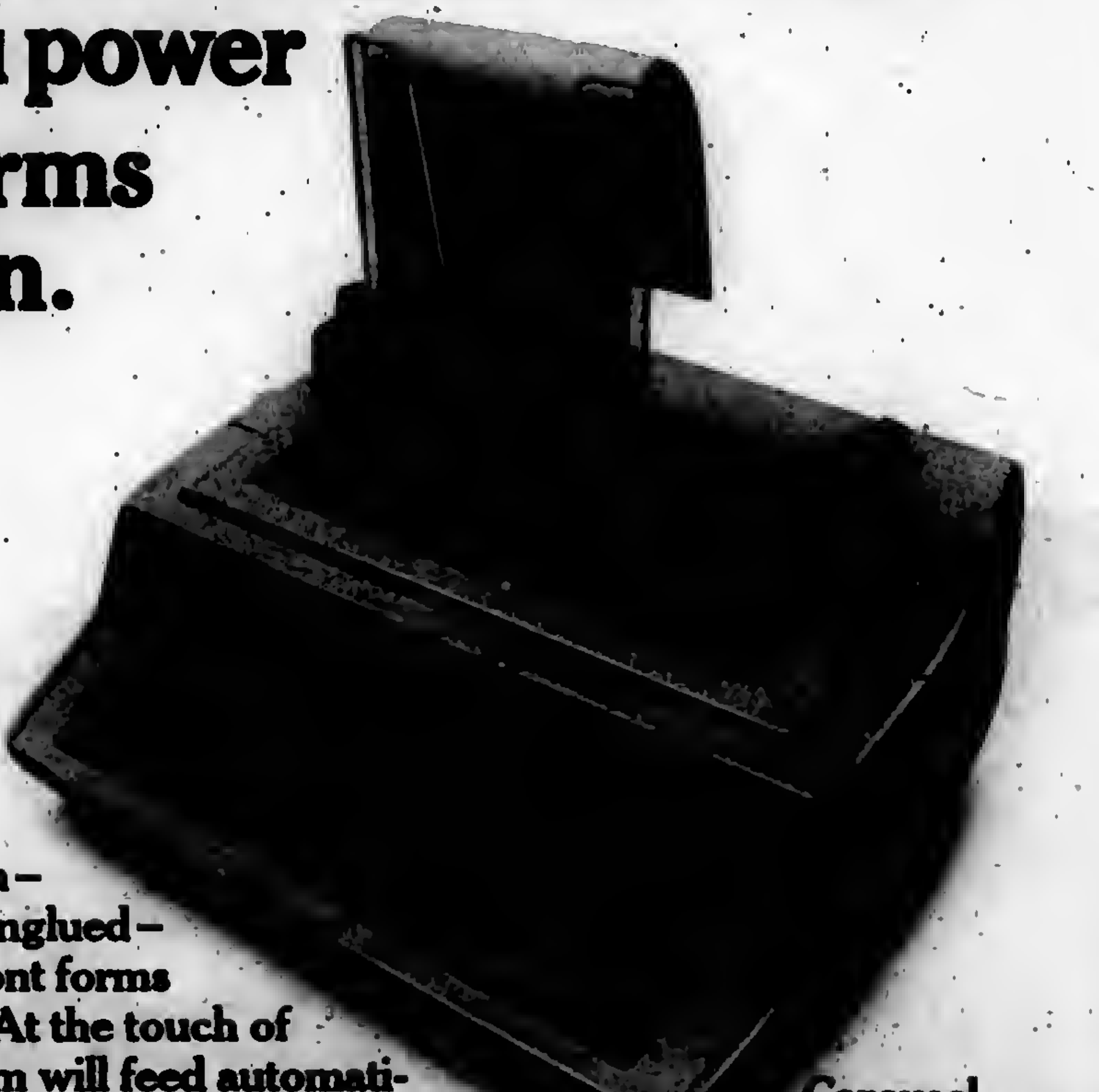

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Despite Current Antitrust Suit, Carter Eyeing IBMers for Posts

(Continued from Page 1)

tion.

Watson's sons — Tom Jr. and Arthur — were both active in supporting political figures and campaigns. Thomas J. Watson Jr., who ran IBM from May 1956 until June 1971, was said to be particularly active in Democratic affairs while Arthur, who headed IBM World Trade until he was named ambassador to France by ex-President Nixon in 1970, contributed heavily to the Republican party, donating $300,000 to the 1968 Nixon effort.

T. Vincent Learson, chairman of IBM before Cary took over that position in 1973, also apparently backed Republican candidates. He is said to have seriously considered an ambassadorship or Cabinet post in the latter days of the Nixon administration, but declined because of the Watergate scandal.

However, he became the U.S. representative to the Law of the Sea conference at the request of Gerald R. Ford.

The historical record hardly shows a time when three or four cabinet posts were occupied by people with close ties to IBM, as could happen in the Carter Administration if those currently being considered for jobs actually land them.

And, meanwhile, the Carter team will have to make important decisions about how vigorously the government's case against the corporation will be pursued — or whether in fact it should be settled even at this late date by a consent decree.

But while it is rare for IBMers to land a wide variety of sensitive Cabinet posts that could affect the future of the firm, the reverse is not true.

In fact, high-level government personnel, particularly from the Justice Department and the federal scientific establishment, have steadily made their way to IBM when their terms of government service were over.

The most notable have come from the Justice Department, and in fact the two most recently hired legal counsels for IBM both served as U.S. Attorney Generals — Burke Marshall and Nicholas deB. Katzenbach.

Katzenbach, who was Attorney General under Lyndon B. Johnson, is now defending the firm against a lawsuit filed by his successor, Ramsey Clark.

Lewis Branscomb, who now is helping the President-elect formulate science and technology policy, was a director of the National Bureau of Standards before he joined IBM in 1972. He is one of the few IBMers who may make the move back from Armonk to the shores of the Potomac.

And while the Cabinet posts will give IBMers a high visibility in Washington, that does not really reflect the full influence the firm may have in the Capitol.

IBM is number seven on the list of companies that have contributed personnel to governmental advisory committees — there are 45 IBMers on one committee or another advising the government.

AT&T, which is also embroiled in a lawsuit with the government on antitrust grounds, leads that list with 130 of its employees on government committees.

And John deButts, AT&T chairman, is also advising Carter on the business scene.

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DataComm 77
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DPMA Poll Finds Privacy Still Most Critical Issue

By Ann Dooley
Of the CW Staff

CHARLESTON, Ill. – Privacy was rated the most critical issue facing the DP industry in an Education Foundation survey of 4,000 Data Processing Management Association (DPMA) members conducted here recently.

The rights of individuals, security of files, costs, the need for defined state and federal guidelines and the determination of who should define such questions were concerns mentioned by respondents who ranked privacy first in a list of 39 critical issues.

Of the 2,900 submitted comments relating to these issues, 15% listed some aspect of the privacy problem.

Education was ranked the second most important issue by 10.8% of the survey respondents. Their concerns included accreditation, curriculum standardization, entry-level requirements and the need for definition of a common body of knowledge of DP.

Also cited was the need for continuing DP education and DP education for end users, the general public and top management. Cross-department training and DPers trained in the business of the employer were also stressed.

'Adamant' About Education

The survey respondents "were pretty adamant about that," according to Roland Spaniol, president for the board of regents for the Education Foundation.

"They felt there was a problem of their work not being appreciated and that was because users didn't understand computers and DPers didn't understand their industry," he explained.

Standards, cost effectiveness and security were ranked as the third, fourth and fifth most serious issues respectively for the industry. Those mentioning standards wanted everything in DP standardized, including languages, hardware, software, data communications, terms, vendors, performance and forms, Spaniol said.

"I was amazed at what people wanted to standardize," he said. "I'm not sure the industry is ready for that much."

Pleased With Answers

Spaniol said he was pleased with the answers. "Knowing you're sick is part of the problem of improving yourself.

"People are working on the problems, but they're not organized." Problems won't be solved until the individual, the professional societies, industry and the government work together to find solutions, he said.

"The results were pretty much as I expected but I thought more people would be interested in social impact and the part DP plays in our lives," Spaniol said, adding he also expected DPers to be more interested in certification and licensing, which were ranked 10th and 24th.

"Disaster planning was rated 37th out of 39; I guess people aren't concerned about that anymore," he said.

The purpose of the survey was to focus on what should be happening and what needs to be done in the industry, according to Spaniol.

Auto Chase, Search Ends With NCIC Hits

TYLER, Texas – Officers of the County Sheriff's Patrol were checking a Pontiac Trans Am with Missouri license plates here recently when the occupants drove away at a high rate of speed.

After an extended vehicle chase and terrain search involving several patrolmen, the occupants were located and detained while checks of the Federal Bureau of Investigation's National Crime Information Center (NCIC) were made through the Texas Crime Information Center.

"Hits" were received on all three individuals and the car, NCIC officials said.

A stolen vehicle record for the car had been entered in the Missouri Uniform Law Enforcement System (Mules) and NCIC earlier that day. The other NCIC hits showed one individual was wanted for strong-arm robbery, the second was wanted for auto theft and the third was the subject of a missing person search.

The three individuals were held by the County Sheriff's Office on local narcotics charges and appropriate detainers were placed.

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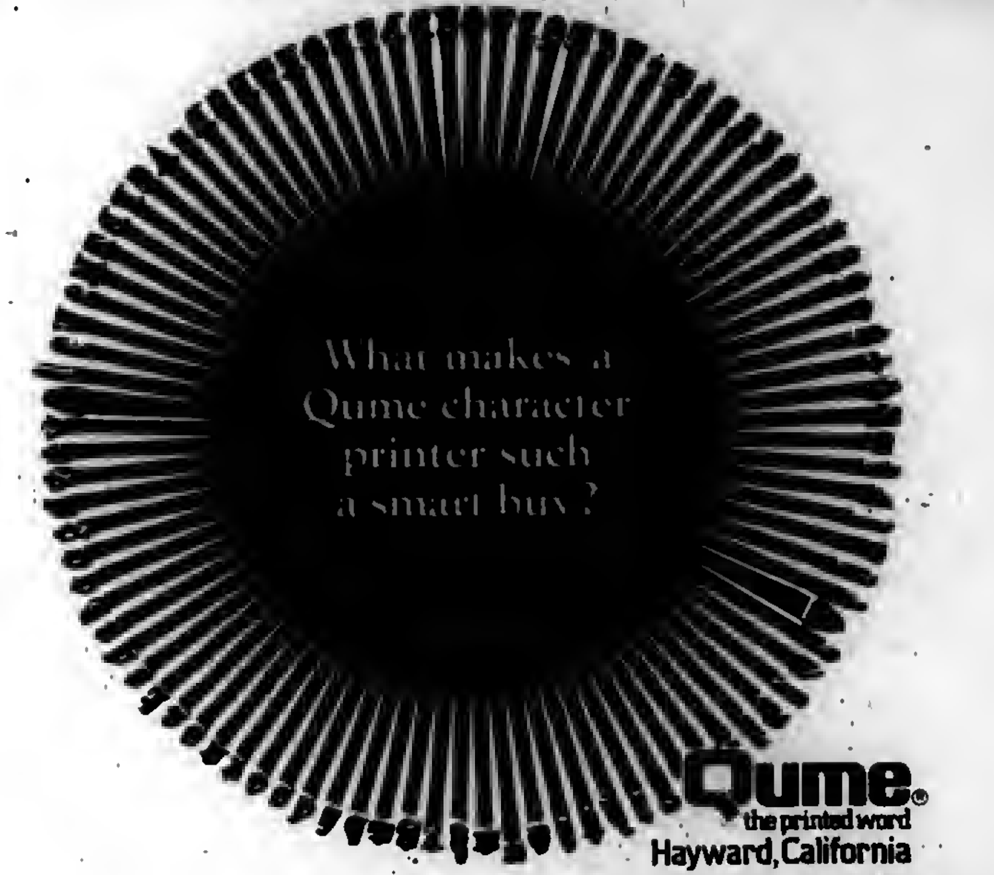

FAA Admits Shortcomings Of RDP Tracking System

By Ann Dooley
Of the CW Staff

INDIANAPOLIS — Federal Aviation Administration (FAA) officials admitted before a congressional hearing here recently that there are serious problems with the radar data processing (RDP) system at 20 FAA air traffic control centers across the U.S,

Outages have occurred frequently in the computerized system, forcing air traffic controllers to switch to manual backup systems [CW, Sept. 20]. The controllers have locked horns with the FAA over the continuing problem.

"Allegations have been made that system interruptions pose a hazard to aviation safety. This is simply not the case," Warren Sharpe, director of the FAA's Airways Facility Service, testified before the House Government Operations Committee's Government Activities and Traffic Subcommittee.

But a spokesman for the air controllers gave a different view. "With no warnings at all, you are battling the element of surprise. Abrupt confusion takes hold of your mind as you immediately turn toward preventing the ultimate disaster — a mid-air collision," Jim Logan said.

Those who are "unversed" in the system's technical aspects might see the problem as more severe than it actually is, Sharpe indicated. "The system was designed to accommodate interruptions without derogating safety," he said.

"The people who make these determinations sit in Washington or regional offices and are so far removed from the actual separation of aircraft that they could hardly be considered experts on the matter," Pete Foltz, another controller, responded.

Valuable But Imperfect

While Logan and Foltz agreed the RDP system is a valuable aid, they insisted it still has a long way to go. The outage problem has been with the system since it began, Foltz pointed out.

But "we are not aware of any possible way in which unscheduled interruptions can be reduced to zero," Sharpe said. "This is just not technologically feasible with so complex a system upon which so many demands are placed."

Controllers complained that confusion and tension occur whenever a transition to the manual backup system has to be made.

"There is approximately a 45-second to 5-minute time lapse while making the transition from narrowband to broadband. This can result in a situation out of control.

"This time lapse is directly proportionate to the traffic volume and degree of complexity when the failure occurs. A situation such as this becomes more than a control problem; it becomes one of survival," Logan warned.

"Up to the present, 'Lady Luck' has been with the controllers and the flying public. But what happens someday when she's overlooking Los Angeles and doesn't have time for Indianapolis?" he asked.

"The FAA came in with what it thought was a locked-up case," Dave Lakin said. Lakin is press secretary to Rep. David Evans (D-Ind.), who sponsored the hearing.

While the FAA argued during the hearing that safety remains constant although efficiency might vary, the controllers maintained that when efficiency goes down, so does safety, Lakin said.

The FAA eventually admitted to shortcomings in the RDP system, however, and discussed changes and planned improvements, according to Lakin.

"We have increased the emphasis on reducing system interruptions and will continue to stress management awareness of the problem," Sharpe said.

A new backup system known as the Direct Access Radar Channel (Darc) is being planned and will be ready by 1978, he said. The Darc system will be similar to the existing main system and will be a great improvement over the manual backup now in use, he added.

Ten Terrifying Questions to ask a person trying to sell you a computerized personnel/payroll system

Terrifying question number one
OK, so we're sold on using a system—who's going to install it? Are you equipped to do it? Can you get it up and running fast? Are experts on hand who have done it before? Will you give us tender, loving care while you install our new system? Will we get good support after we're up-and-running?

Terrifying question number two
Will the system's value exceed its cost? Can you prove it? Exactly where will savings come from? How will costs be cut? Can you give us figures showing savings in time, money, and better use of our staff?

Terrifying question number three
What's your track record? How many systems are actually in operation? Do your users boast about the system? Are they happy? Will they pass on the good news? Is there any good news?

Terrifying question number four
How about documentation? Will we know exactly what we've got? Is it easy to understand? Can we take the reins quickly? We need high quality training and manuals. Will you provide these?

Terrifying question number five
How about reports for EEO, ERISA, and OSHA? Can we handle those? I mean really handle them. Can we meet compliance demands quickly and inexpensively? We'd like to relax on that score.

Terrifying question number six
Will it be a hassle every time we need information? Can our Personnel or Payroll Departments retrieve information without calling in a programmer? Can your retrieval system understand English?

Terrifying question number seven
How flexible is the system? Can we expand it as we grow? Will your people sit down and discuss our particular needs and tailor the system to them? How comprehensive is your Payroll system? What about manpower planning, salary and benefits administration? Or health and safety programs?

Terrifying question number eight
Can you provide a forum—seminars, and so forth—for our personnel, payroll, and data processing people? Can we talk to other users grappling with the same problems? In other words, can you help us keep in touch with the the industry?

Terrifying question number nine
If we can't use our computer, must we shelve the idea? Can we run the system on your computer? Do you have a systems service division to help us do our work? What other clients do they handle? What kind of turnaround can I expect?

Terrifying question number ten
Is your organization stable? Are you financially secure? Will you still be around five years from now if we must expand the system? Are you growing?

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MEMOREXCELLENCE

Ware Warns of Need for Policy To Prevent Information Abuse

By E. Drake Lundell Jr.
Of the CW Staff

HANOVER, N.H. – Computers and information systems are being used to "tighten" controls in society and the U.S. needs a public policy on information to determine just how tight a society is desirable, according to Dr. Willis Ware, vice-chairman of the Privacy Protection Study Commission.

Speaking at Dartmouth College's recent symposium on "Man and the Computer" here recently, Ware said this issue is much larger than the questions raised by privacy rights in the computer age.

One of the first questions to be faced in such a policy study would have to do with the right to ownership of information, he noted. The question of who owns data – the collector or the subject – has to be faced, he said.

Another problem is raised by the possibility of surveillance that comes with the development of large national networks like those proposed in the electronic funds transfer area, Ware said.

None of these systems were proposed or developed with surveillance in mind, but they will contain a body of information that will permit surveillance, he added.

In the absence of a policy preventing abuses of those systems, it is a certainty abuses will occur, Ware warned.

Another area that needs to be examined is the problem of liability in large computer systems, he said, particularly in those systems where machines are routinely making decisions previously made by humans.

In setting a national policy on information, the needs of government and other large organizations for information have to be balanced against the individual's rights to privacy, Ware indicated.

Today there are no real controls over the use of information except in a few particular areas, he added.

The public policy that needs to be developed must establish a framework to prevent harm from the misuse of information or at least give anyone harmed by such misuse a legal right to redress, he said.

Brown Again Nixes Calif. Privacy Law

SACRAMENTO, Calif. – For the second year in a row, Gov. Edmund G. Brown Jr. vetoed an information practices bill, passed by the state legislature, on grounds of cost.

Instead of a law, however, Brown issued an executive order to accomplish the same goals at a lower cost.

In a message issued at the time he vetoed SB 1586, Brown estimated the legislative measure would have cost $4 million to start and $13 million more every year.

The executive order called the right to privacy and the right to petition one's government for redress of grievances "fundamental rights granted and secured to all individuals by the California Constitution."

Model Role

The executive order will give state agencies an opportunity to serve local governments as "a model" of good information practices, according to the order, which takes effect Jan. 1.

Agencies have 30 days to give an individual access to his file unless it is "stored." In such cases, 60-days' elapse time is allowed.

Individuals are not permitted access to any file that does not pertain to them except in the discovery phase of litigation.

Agencies must make any correction requested by an individual, permit him to file a statement of dispute as a permanent part of the file or destroy disputed information within 30 days of receiving a written request.

The order may not be interpreted as giving an individual access to information compiled in anticipation of a civil action or administrative proceeding against him nor may it be interpreted as permitting an individual access to information which is confidential by law.

Files maintained by agencies for criminal investigation or for the purpose of enforcing criminal laws or preventing crime are exempt to protect informants and investigators, the order said.

If an individual is dissatisfied with an agency's actions in fulfilling this order, he can file a petition for mediation.

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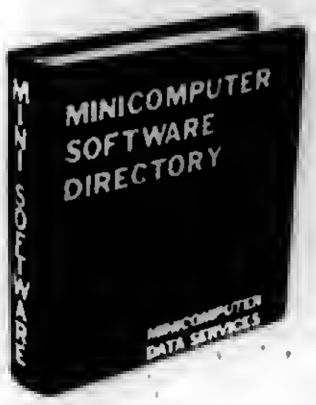
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State Using Economic Prediction Model Cited as Most Comprehensive in Nation

By Ann Dooley
Of the CW Staff

MADISON, Wis. — The State of Wisconsin is now using an econometric model to forecast its economic future.

Originated primarily for Gov. Patrick Lucy and the state Legislature, the system is believed to be the most comprehensive model in the country, according to Monte Herrell, economist for the Bureau of Fiscal Policy and Analysis in the State Revenue Department.

The model is used primarily to analyze policy and to forecast state revenues on both short-term and long-term bases, Herrell said.

"We can forecast annually to the year 1990, but I admit we have a little less confidence in that long-range information," Robert Milbourne acknowlhedged Milbourne is chief of the Bureau of Fiscal Policy and Analysis.

The model, which is still being refined, is divided into 11 subsectors including such economic factors as tourism, the dairy industry, durable and nondurable goods and local government.

Multiple regression techniques can be used to manipulate 270 equations to project a variety of hypothetical possibilities, Herrell said.

The model includes data on employment, wage rates, estimated government expenditures, state tax revenues, agriculture, manufacturing, tourism and population trends, he added.

The model was developed under a contract with Data Resources, Inc. (DRI) of Lexington, Mass., using a Burroughs B7700. The system operates on DRI's telecommunications system using dial-up lines and CRTs.

State employees have access to the model via time-sharing facilities at government offices.

The system enables state legislators and the governor to estimate the economic impact of a state or federal policy change before making a decision on it, Herrell said.

"The Agricultural Department can estimate farm prices in advance, the Department of Health and Social Services can predict the unemployment rate and the welfare caseload for the future and we at the Revenue Department can learn how much additional revenue we'll get from a specific change in the tax law," Milbourne said.

DP Finds Chimps Forecast Quakes

MENLO PARK, Calif. — Data stored in a computer has led scientists at the Stanford School of Medicine here to believe earthquakes can be predicted by observing the behavior of chimpanzees.

In an effort to explore the accuracy of recent stories about earthquake prediction by villagers in China, the scientist decided to examine data gathered about chimp behavior during some minor quakes in June at Stanford's outdoor primate facility near the San Andreas fault.

On the day preceding each of two quakes, the chimps showed distinctive signs of restlessness.

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Editorial

A Concept Gone Astray

The recent 10th anniversary of the Kiewit Computation Center at Dartmouth College was graphic proof of how far man and the computer have progressed,

And how far they still have to go.

The computer has been effectively developed as an educational tool at Dartmouth so virtually every graduate leaves with the feeling that a terminal is an intimate friend and assistant. These graduates can translate this familiarity into career assets, especially in management.

There is little doubt the '60s at Dartmouth were a watershed in the pioneering of time-sharing, the development by John Kemeny and Thomas Kurtz of an easy-to-use programming language called Basic and the coming of a general attitude that sees the computer as a tool for all instead of an advantage only for the chosen few.

But the impressive achievements at Dartmouth bring into sharp focus how much still has to be done. Dartmouth has developed a unique man-machine interaction duplicated in few other places.

At a symposium called, appropriately, "Man and the Computer," Kemeny, now Dartmouth president, pointed out that little progress has been made toward the goal of an "Everyman's terminal" that would be low-cost and simple enough to be used by all. The elusive computer in the home has been stalled dead in its tracks for lack of the proper equipment and other social reasons, he noted.

The Dartmouth time-sharing concept emphasized the interaction of students at different schools and in different disciplines. But this concept has been sidetracked by the growth at other educational institutions of individual minicomputer systems which the Dartmouth devotees feel are isolating the user.

Perhaps ironically, the Dartmouth time-sharing system has been successfully adapted into a business system and is now used by a handful of large corporations. At the same time, the number of high schools on the Kiewit Center has dropped from more than 20 down to two because more and more high schools are getting minis.

If the computer is to gain a universally accepted position in the way man lives his life and operates his business, more attention should be paid to the attitudes that prevail at Dartmouth.

There are those that claim an educational time-sharing system is several light-years removed from a cost-effective DP center helping a competitive corporation to optimize its profit margins. Maybe so, but there are some important analogies to be drawn between the student who cuts down on homework time with the Kiewit computer and the company president who utilizes a management information system to save dollars for his firm.

'Well, at Least They Aren't Kidding With Their "Lifetime Career Opportunity"...'

Letters to the Editor

IBM Not Only Vendor

Stephen E. Wright's "Programmers Finding How to Use PERFORM"[CW, Nov.29], while quite interesting, was an example of the all-too-common assumption that IBM is the only computer vendor.

The article was general until near the end, where Wright wondered why the PERFORM statement does not generate in-line code and noted this would improve performance in a VS environment.

Oddly enough, some vendors — Univac, for example — do generate in-line code for the PERFORM statement. Also, "VS" specifies a vendor-specific feature to which non-IBM users have difficulty relating.

If Wright had made explicit reference to IBM in his last three paragraphs, the article would have more truly stated what he was trying to convey: that IBM's implementation of the Cobol PERFORM verb should be improved because structured programming has prompted a significant increase in its usage.

Walter J. Gilbert

College Park, Md.

A Word of Caution

While I agree with Stephen E. Wright ["Structured Programmers Should Build on Sections," CW, Nov.15], a word of caution is imperative.

A Cobol section will be executed until another section name is encountered. If you wish to terminate processing of a particular section at an EXIT statement, you'd better follow it with another section name or, if in the Declarative Section, the statement END DECLARATIVES.

Failure to do this will cause processing to continue until the next section name or the end of the Procedure Division is reached. Unfortunately, this is a little known concept and can cause serious debugging problems when used.

William C. Franken

Green Bay, Wis.

Sales Forces Missing the Boat

It was recently my displeasure to require the purchase of two IBM 2316-type disk packs. Wishing to get the best price, I attempted to contact several manufacturers for a price quote.

After calling Memorex, Syncom, BASF, Control Data Corp. and 3M and being switched from department to department in an exasperating telephone search for the elusive "salesman," I had invested three hours of time without one single price.

CDC kept switching me to a department which stated I was asking in "nonstandard" equipment numbers, and 3M could not understand I was not purchasing supplies for a tape recorder.

Won't *someone* in a vendor's sales force ever learn what products are being sold there?

Richard D. Peters

Washington, D.C.

Looking at the Bottom Line

The Page 1 headline ["CPE Finds Three 65s Can't Equal a 168"] in the Nov. 2 issue is undoubtedly true. Whoever denied it?

But the American Airlines evaluation and benchmark team have overlooked one very important fact. For the price of one Model 168, you can lease *six* Model 65s.

And you'll have enough money left over to hire three programmers and a new evaluation team . . . one with a clearer view of the bottom line.

James F. Benton
Executive Director

Computer Lessors Association, Inc.
Washington, D.C.

(Other letters on Page 20.)

Data Past

Five Years Ago
Dec. 15, 1971

BETHESDA, Md. — The General Electric time-sharing network offered a series of capabilities designed to extend flexibility without additional cost. The changes ranged from a means of finding out network information and services to a Fortran IV debugging package.

— — —

AKRON, Ohio — A debugging system that "reversed nearly every approach normally used" in developing on-line programs and located bugs "in a fraction of the time" required by older methods was patented by The Goodyear Tire and Rubber Co.

Eight Years Ago
Dec. 18, 1968

ARMONK, N.Y. — IBM hinted it would price support services separately by July 1, 1969. Industry sources speculated that on or before July 1 IBM would charge for certain types of software, probably applications packages.

These sources thought it unlikely IBM would charge separately for monitors, operating systems, executive routines and other software fundamental to the operation of its computer systems.

The sources also speculated that IBM would charge separately for customized programming assistance, education and training courses and publications.

— — —

CHIPPEWA FALLS, Wis. — Control Data demonstrated its 7600 system for the first time. The system was a redesigned version of the 6600 "Super Computer" introduced five years before. The 7600, aimed at time-sharing users, was said to be four to eight times faster than its predecessor.

Transportability Should Be Base of Software Standards

By Tim Hagen
Special to Computerworld

There are two main reasons for the appearance of higher level programming languages: the desire to allow problems to be programmed in a people-oriented rather than a machine-oriented way and the desire to allow those programs to be machine-independent, i.e., transportable.

Modern high-level languages have largely succeeded in the first goal; hardly anyone would dispute that languages such as Cobol and Fortran are much more people- than machine-oriented; even if he feels that there is room for even more refinement.

The second goal, machine independence or transportability, has been largely met, but hardly anyone would suggest it has been ideally attained. There are several reasons for this:

- There may be very good reason to take advantage of machine features in some programs.
- Manufacturers wish to lock in customers to their equipment and software, so they provide nonstandard or extended language features which tempt programmers. The moment one of these features is used, transportability goes out the window.
- Programmers and their managers are frequently all too happy to take up manufacturers on their invitation to use nonstandard features for reasons of expedience. The programmers can hardly be blamed for this, given the pressure cooker environment in which they are usually put.
- There may be no standard for the manufacturer to follow in implementing very desirable software features such as file handling in Fortran, string handling in Basic and data base interface languages in general.

This is the direct fault of standards makers in Washington. Their failure to respond to the challenge to provide meaningful, current standards to lead the way — instead of half-heartedly adopting lowest common denominator features a decade behind the times — is and will continue to be one of the most expensive cases of negligence ever suffered by the industry.

Site-Specific Standards

Despite all this, responsible, conscientious managers have instituted programming standards within their own installations with respect to documentation, language features to be used and sometimes program logic and structure. The reason for these standards is basically to protect the installation from the effects of transient personnel and, secondarily, to allow the separation of the program development and maintenance functions.

Another strong consideration in the formation of standards is the idea that if programs are kept simple, by force if necessary, somehow they will be written and debugged more quickly. While I agree with this, I also believe this concept should be given a long, hard look before it is arbitrarily applied with the assumption it is true.

In all but very few cases, little thought is given to transportability of programs as an object of standards. This may be because the installation manager is a devotee of some particular manufacturer or because people just naturally tend to think about how to do the best job with the equipment they have or tend to add to what they have instead of possibly getting a new machine someday.

Why is that? Because a new machine is a headache in terms of conversion.

Why is that? Because transportability was not assured by proper programming standards.

Lack of consideration for transportability has therefore led to its own vicious circle, and an installation must pay the price one way or the other for that failure when an upgrade or a new machine is needed.

What should be done? Make transportability the basis of programming standards, not an afterthought. This will leave the installation in an excellent position when an upgrade or a new machine is needed or when the vendor expresses his latest regrets for rate hikes.

It may and should also influence the selection of programming language, as I have previously discussed [CW, April 5]. One certainly would not want to choose a language that is without any standard or wide implementation.

Reader Commentary

It may seem at first that making transportability the primary objective of programming standards is either nonsensical or at best an inversion of priorities. But some thought will reveal that it accomplishes the other objectives of programming standards.

Transportability considerations are twofold: hardware and software. Hardware may be taken care of rather simply, by doing such things as assuming that one has a 16-bit machine that will take no more than two characters per word, any integer larger than $2^{15}-1$, any exponent outside the range ±31 and minimizing the number of files accessed.

The software part is more difficult. It requires that the installation do what the standards people have forced, go to the lowest common denominator of language features, those which have been standardized already, at the very least.

To go further, which may be a good idea, one should realize the manufacturers claim adherence to standards rather lightly. Even if they are in strict adherence, they are frequently far from the spirit.

For example, I have seen a "standard" Fortran which had a large number of reserved words; although it allowed variables six characters long, it required all variables to be unique in the first five characters.

It also gave no warning of any kind if two different six-character variables were not unique in the first five. This was plainly — and the manual admitted it — for the manufacturer's convenience. Such Mickey Mouse shortcuts to compiler and interpreter implementations abound among mini and microcomputer suppliers.

Lowest common denominator standards often, if not always, yield a smaller number of language features than a standard which rejects some features as being too "fancy" for the taste of the standard maker.

In so doing, it nonetheless removes "fancy" features and gives a simple language subset which, when combined with a few procedural principles, leaves the programmer with a simpler language environment which tends to render simpler, cleaner, easier and quicker to debug code, because the discipline imposed reduces the likelihood of obscure logic errors.

This leaves the manager in a much better position from which to sympathize with a manufacturer whose prices have gone through the ceiling as its machine goes out the door to make room for a much less expensive one.

Even without this situation, mini and microcomputers will soon be inexpensive enough to begin the dedication of them to some previously centralized production.

The ease with which software can be transported to these machines will often be the determining factor of their feasibility. So making transportability a major objective accomplishes most, if not all, other objectives while maximizing installation options.

In Age of Data Bases, Users Must Check Their Files

It must be a constant aggravation to the marketing people of the Shawmut Bank of Boston that some people, restaurants, stores, etc., simply won't accept Master Charge despite all the persuasions that are offered. So it is not surprising all sorts of schemes have been thought up.

The Taylor Report
By
Alan Taylor, CDP

One came to fruition last month which will probably help the bank obtain more interest-bearing loans, but appears to be an illustration of how unexpected results will arise when computer files are used for unexpected operations.

In this case, what appeared to be a routine action resulted in a basic breach of banking security.

The system adopted by Shawmut is called Master Checking. To quote the advertisement sent to thousands of Bostonians:

"It's a way to get a cash advance from your Master Charge account by writing a check from a little book of Master Checking checks. They look like personal checks, so only you know when you write one that you're drawing on your Master Charge line of credit."

The blurb was quite correct in its description. The Master Checking checks do look like personal checks. True, the book is different; there are neither check stubs nor any place to record such data as to whom checks were paid, when or for what. Apparently Shawmut doesn't encourage its Master Charge people to keep such records — just to go on signing unrecorded checks on their accounts.

Printed on the outside of the book are the words "Master Checking," which aren't always seen when a check is handed over. As the blurb stated, "They look exactly like personal checks."

As personal checks, they are as open to forgery as any other check. In particular, unlike open credit card charges, they are in no way limited in amount.

Bank Tradition

Personal checks, particularly blank ones, are regarded as valuable documents by banking tradition. "Negotiable instruments" is the jargon phrase. They are not to be scattered around wholesale by any responsible banker.

When accounts are opened, the importance of keeping them secure is impressed upon the accountholders. Watching to see that checks have not been taken surreptitiously from the back of the book is only one of the precautions accountholders are again asked to take to ensure no blank checks get outside the immediate control of the proper hands.

When replacement books are sent out by mail, accountholders are asked to check they are complete and to safeguard them. And the books are sent out only after a direct request from the accountholder, so there is no question they are wanted and expected.

Whether the marketing people or the banking authorities know about it, the recent Shawmut action ignored these elementary precautions. The lack of check stubs, the failure to number the checks and a system which doesn't even return the check to the accountholder all encourage poor security.

The Shawmut people must be expected to know these design points. But did they realize the computers would send the checks out to nonactive accountholders at obsolete addresses?

I doubt it, but it happened.

And it seems to be the typical type of computer error which we will see more and more as we go into data bases.

One such unwanted, unexpected checkbook was received by a former Master Charge accountholder who had canceled his account and cut up and returned his card some months ago, along with a new card he received. His name and his wife's name were imprinted on the checks. The checkbook came unannounced by ordinary mail in mid-November.

No receipt was requested. Nothing else had been received for months since the account was closed.

Tracing the Error

Clearly, the Master Charge files were used without being purged. Shawmut only knows that the people on file have at some time been cardholders. It knows a superset of the current cardholders, but not the actual people. And it probably never realized this.

It is quite natural that this is so. File designers will argue until they are blue in the face against including "unnecessary" fields. For processing the credit card system, there is no need to record whether a cardholder has closed his account.

All that matters is the amount of available credit. Change the credit limit and you can simulate the result of closing an account by the bank. Do nothing and purge the file annually of nonactive accounts and you can simulate the result of closing the account by the cardholder.

Have a few algorithms about ceasing to send monthly statements to nonactive accountholders and there is no reason to waste space recording "close" instructions. No reason as far as the systems analysts can see, that is.

Nor is there any reason for overruling the file designers' decisions apparent in the marketing department (assuming they were known, which is unlikely). The file has been successfully used for all sorts of marketing purposes — such as investigating attitudes to credit questions and various other promotional mailings.

There is nothing wrong with using a superset of accountholders; all it wastes is a few stamps and, who knows, some people may reactivate their accounts.

It's almost certain that when the idea of sending checks was discussed, no one in marketing, security or DP realized a security breach was being committed or that Shawmut didn't have records showing who had closed their accounts.

Concrete Example Omitted

When I wrote the Nov. 22 column about getting ready for data bases, I wasn't able to give a concrete example of what type of mistake would occur as a result of the turnover — not because I couldn't think of one, but for the simple reason that any hypothetical "error" can be objected to on the following grounds:

- People would have included more data in the hypothetical file.
- People would have instituted a more rigorous selection procedure in making extracts from the superset file so as to obviate the problem.
- People would never think of using the file for the distribution of valuable negotiable instruments.

Only the history of mistakes that have actually taken place can really document the type of problems that are coming and can help in their extirpation.

That may require the introduction of a new three-letter word into our DP jargon — but that's for another article.

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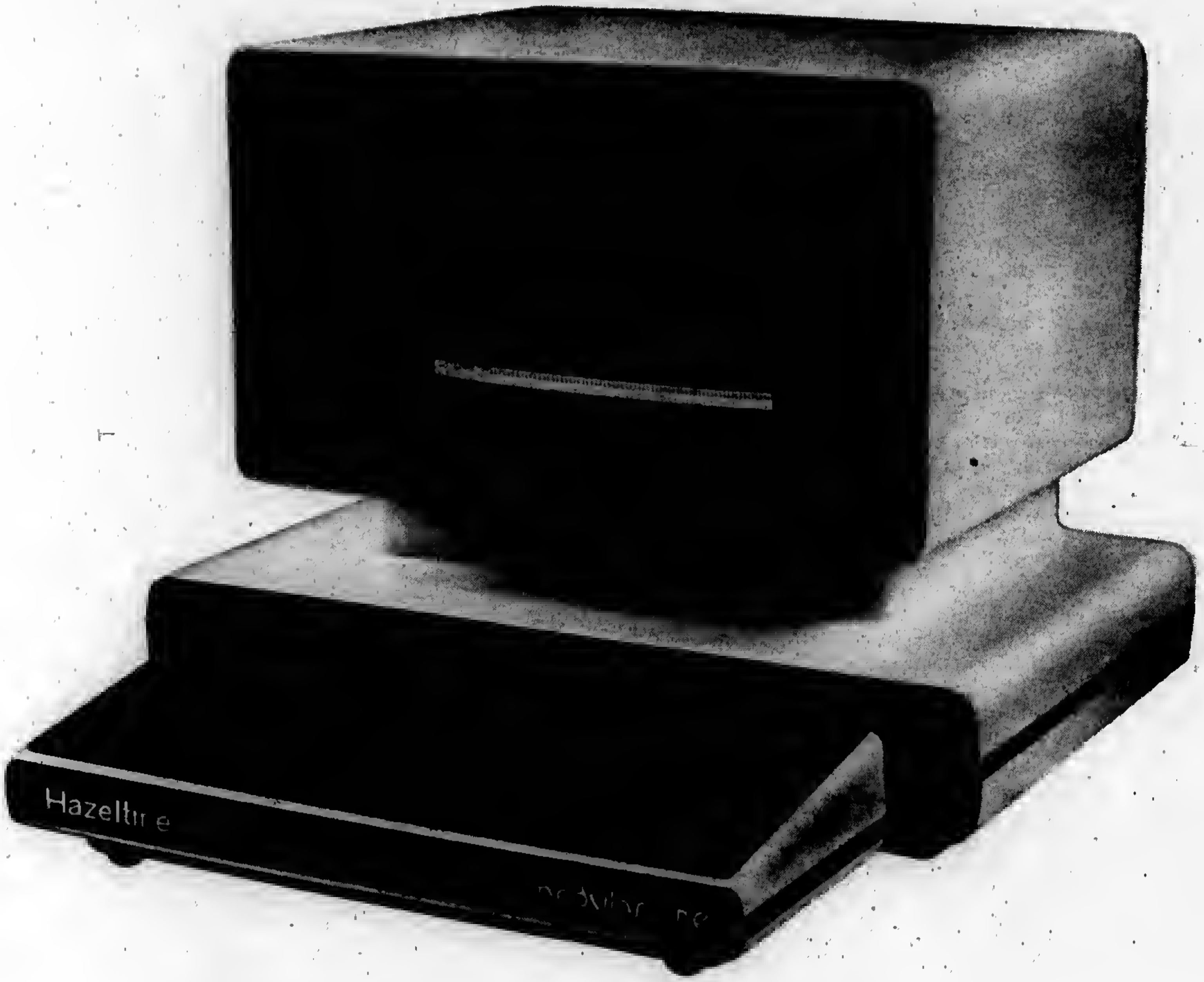

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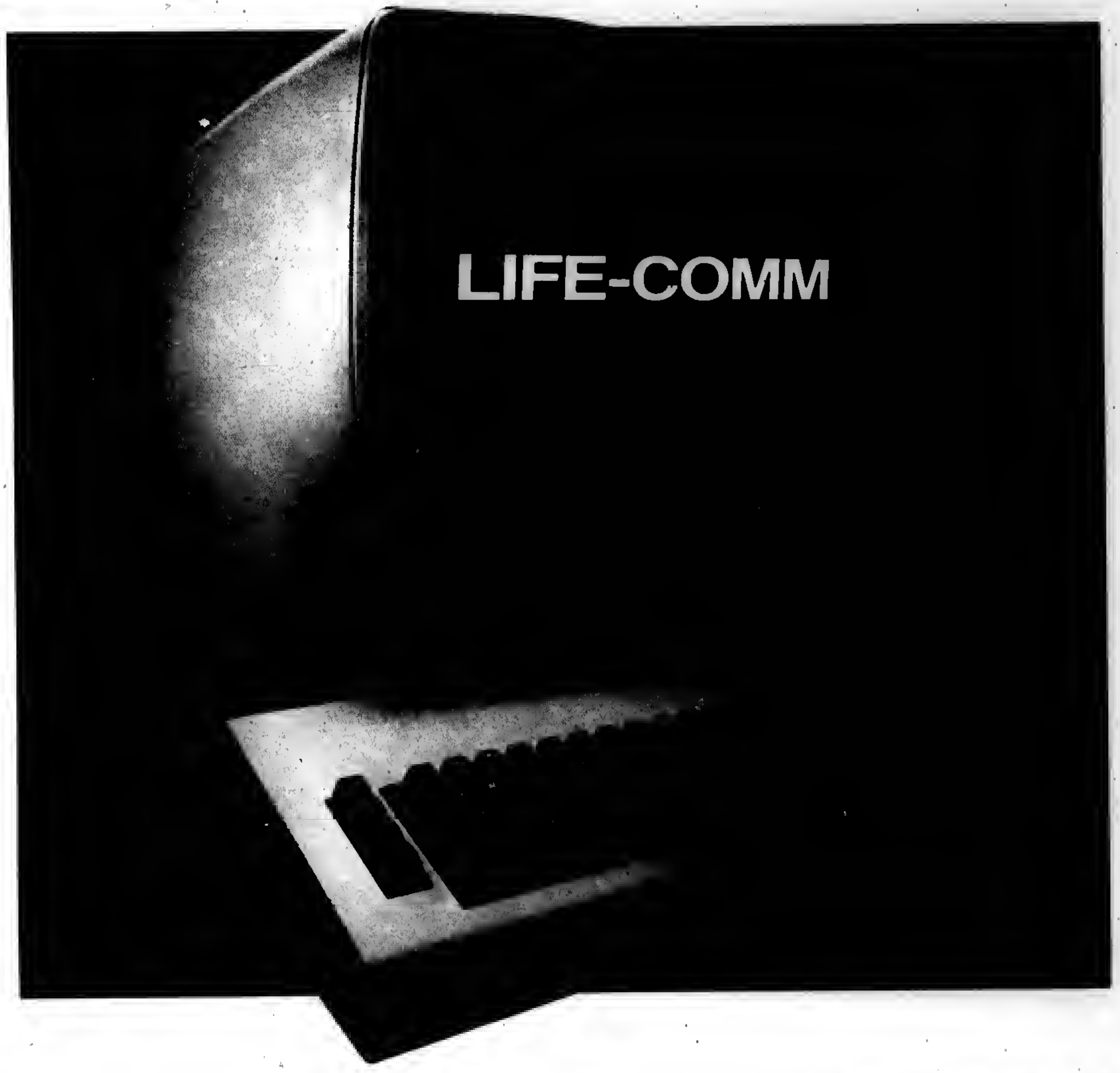

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Reader Commentary

Tech Writers' Prospects Great As DP World Comes Full Circle

By Joseph T. Rigo
Special to Computerworld

In the beginning, the chief programmer had an editor to help with the paperwork. The editor kept the specs up to date and wrote manuals for customers and the field service staff.

These days, the chief programmer has a computer librarian/documentalist. This person corrects spelling and grammar, files listings and runs out for coffee.

What happened to the editor?

Harlan Mills of IBM invented the chief programmer team. Fred Brooks described the original concept in his book, *The Mythical Man Month*. Among other things, Brooks said:

"The [chief programmer] is responsible for generating the documentation — for maximum clarity he must write it. This is true of both internal and external descriptions.

"The editor, however, takes the draft . . . and criticizes it, reworks it, provides it with references and bibliography, nurses it through several versions and oversees the mechanics of production."

Mills and Brooks saw the editor as a high-class person. They even supplied the ultimate accolade — a secretary to help keep the paper flowing.

Other companies wanted to adopt the chief programmer concept. After all, if it's good for IBM, it must be good for the First Bank and Trust Co.

Right? Wrong.

Mills invented his team in the environment of an IBM development laboratory. The concept is ideal for programmers who produce highly complex software, such as operating systems for virtual storage, time-sharing and multiprogramming.

These projects involve hundreds of people around the world. Eventually programs written in Poughkeepsie, Palo Alto and the Nordic Labs must come together and work as a unit.

It takes a lot of paperwork — constantly updated — to do this successfully.

More paper goes into program logic manuals for the field service staff. And still more goes into user manuals for customer programmers.

The process provides work for several dozen highly trained and experienced technical writers. At least one of them functions in each project team as an editor, in the best sense of the Mills concept.

For contrast, consider the systems department in a large bank.

First of all, the person who does the chief programmer's work, as Mills defined it, is called a systems analyst. This person used to be a programmer, but the only way he could get ahead was to move into a job where his technical skills get obsolete.

Those who remain as programmers aren't allowed to design anything more complicated than a MOVE statement.

This can be very frustrating for a good technical guy who, naturally, loves computers and hates people. He doesn't want to become a systems analyst, but he is essential, so the company makes it up to him by calling him a chief programmer.

This person does not need an editor. He

(Continued on Page 20)

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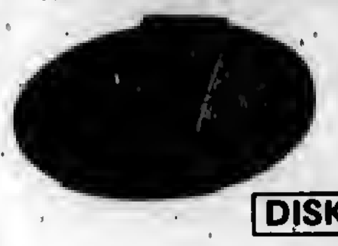

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Letters to the Editor

Getting in Touch

In the Nov. 8 editorial, "Mini Users Take Giant Step," a reference was made to the Minicomputer Industry National Interchange (Mini) organization.

Although the Collins Division of Rockwell International is not a minicomputer manufacturer, we do use the Digital Equipment Corp. PDP-11 extensively.

I would like to know if it is possible to become an associate member of Mini or, at least, be made aware of conferences conducted by this group.

Any assistance you might provide would be appreciated.

William R. Myers
Manager/Advanced Planning
Collins Division
Rockwell International
Dallas, Texas

Mini is located at 2460 Lemoine Ave., Fort Lee, N.J. 07024. Ed.

How About Boustrophedon?

I don't like bidirectional printers – the name, not the device. The prefix "bi-" suggests something that works both ways at once, like bilateral, or sometimes one way and occasionally the other, like bisexual.

What is needed is a word that means writing alternate lines in opposite directions, in the manner of oxen plowing a furrow.

And what do you know, there is already a lovely 75-cent word, *boustrophedon*, with this precise signification.

In an industry where terminological exuberance is by no means uncommon, the boustrophedon printer should achieve immediate popularity.

Stuart R. Sheedy
Lynbrook, N.Y.

Where to Get Reprint

I read with interest the Taylor Report, "DPers Must Get Ready Now for Real Data Base Life" [CW, Nov. 22]. I would like to obtain a copy of the National Bureau of Standards' Special Publication 451, "Data Base Directions — The Next Steps," and would appreciate it if you would let me know where I can obtain a copy of this publication.

James L. Smith
Baltimore, Md.

It can be ordered for $2.40 from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Ask for catalog C13.10;451, quoting NBS-SP 451. Ed.

Outlook Never Better For Tech Writers

(Continued from Page 19)

especially does not need an editor with a secretary.

The entire development team works in one room. Analysts and programmers do their own documentation. A writer may be brought in for the user manual, but this person is not expected to be strong technically.

Still, it is fashionable to have a computer librarian/documentalist on the team. So all the project dirty work is collected into a single job description, and some poor innocent soul is pushed into it.

It is not a real job. It requires a mixture of interests and aptitudes that don't exist in any one person, and it has no future. It is almost always an experiment, and it tends to disappear quickly whenever new management takes over.

Fortunately for the technical writing profession (and for die-hard programmers), the applications world is becoming more complex. A corporate teleprocessing system can require almost as much development paperwork and programming skill as virtual storage.

At the same time, users are demanding more and better reference material for their new systems.

And, finally, the sins of the past are catching up with current managers. Their shops are littered with essential but undocumented systems. They are paying through the nose to get maintenance documentation produced before the last surviving programmer retires to Arizona.

The trend is clear. The tech writer's job is becoming bigger. Prospects were never better for writers who keep up to date technically.

The chief programmer will have his editor back any day now. Complete with secretary.

Rigo is president of Sysdoc, Inc. in New York City.

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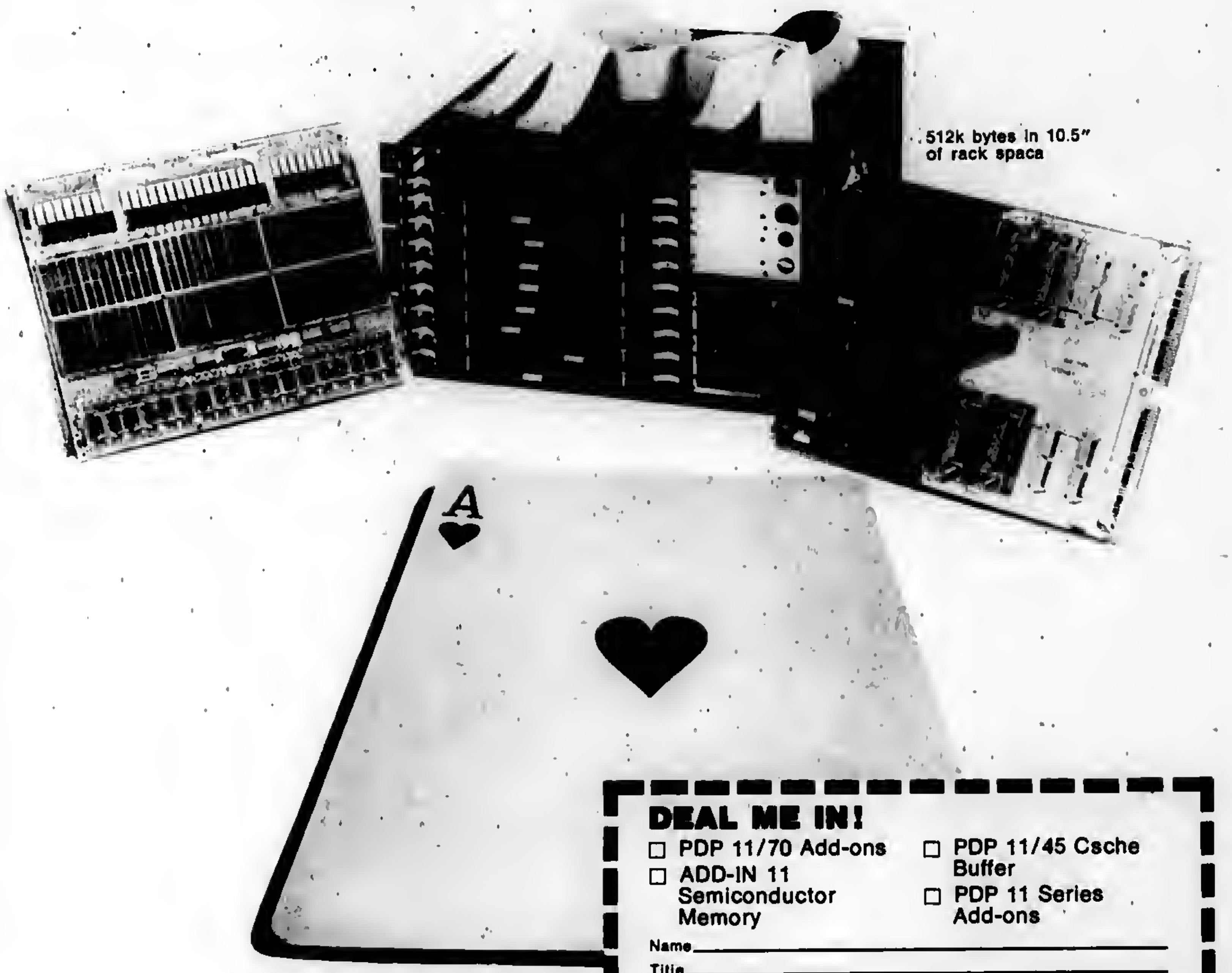

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Random Notes

Program, File Changeovers Eased With NCSS 'Convert'

NORWALK, Conn. — Programs or files can be adapted from one operating environment to another with a process "as simple as compilations" now available on the National CSS, Inc. (NCSS) remote computing network, a spokesman claimed.

Developed by Oli Systems Inc., the Convert process permits the user to develop a set of rules for a specific conversion.

These rules are stored on the network and can be retrieved whenever needed, he noted from company headquarters at 542 Westport Ave., Norwalk, Conn. 06851.

DOS Library Compare Feature Added to 'Dossier' Package

PORTLAND, Ore. — A Library Compare feature, recently added to the Dossier software package from Computer Concepts, Inc., analyzes object code on user libraries and builds a file on program and file usage, a spokesman said.

By comparing this file over successive runs, Dossier users can document changes in IBM DOS and DOS/VS program libraries, he claimed.

The package, including the Compare feature, costs $85/mo under a one-year license, he said from 6443 S.W. Beaverton Highway, Portland, Ore. 97221.

Subscribers Get Price Break On Value Line Data Base

NEW YORK — Value Line Data Services has cut both the annual and the quarterly subscription price for its 65M-character data base of corporate histories and forecasts.

The data base is available directly from Value Line or through any of five remote computing networks.

An annual subscription now costs $5,000 while the quarterly subscription is priced at $2,000, Value Line said from 5 E. 44th St., New York, N.Y. 10017.

'Strobe' Now Monitors DOS/VS

CAMBRIDGE, Mass. — Programmart Corp. has introduced a version of Strobe which supports DOS/VS users with a system performance profile.

Previously the package had been offered only for OS and OS/VS, the company said from 133 Mt. Auburn St., Cambridge, Mass. 02138.

Productivity Management-Part 1

Chaos— Then a Revamped System Cycle

Special to Computerworld

BOSTON — After seven years of uninterrupted growth, a software firm here decided in 1973 it had learned enough to begin bidding for custom software development on a fixed-price basis.

The decision turned out to be a premature one: by the end of the year, the publicly owned firm wrote off more than $400,000 in overruns on fixed-price jobs — an amount equal to 10% of its annual revenues at the time.

"We thought we knew all about large dollar-value development contracts, but we were proven wrong in a very painful way," John F. Keane, president of Keane Associates, Inc., recalled.

So the company took rigorous steps to impose better internal controls. Francis A. Frank, corporate systems manager, and John R. Reilly, senior systems consultant, developed a project management system that went far beyond the system then used by the 150-person firm.

"But it didn't do the job that well, so we looked harder at the problem of precision management of technical personnel. And when we did, we discovered project management techniques, for all their value, control in just two dimensions — time and cost.

"What was missing was a third dimension: the people aspect," Frank stated.

He and Reilly spent the next six months assembling and analyzing 18 major projects — each over $100,000 in value — to piece together a project control system that made sense. They even hired outside consultants from the Harvard Business School to analyze the case studies "with the objectivity we knew we didn't have because of our prior involvement in many of the cases," Reilly said.

The result, borne out in practice during its 1975 operations, was the development of a methodology Keane calls "productivity management." It is a six-step process "that comes closer than any other management method to predicting and controlling the outcome of complex large systems developments," he said.

In the 18 months Keane Associates has used the technique, cost overruns on a similar level of fixed-price jobs have been reduced to under 2%. Keane is so enthusiastic that he recently instituted a series of in-house and general seminars for large customers to train them in productivity management principles; to date, nearly 600 systems and DP managers from 80 companies have taken the course.

"It has become very popular with users. We've scheduled more than a dozen courses right through next spring," Keane said.

Because it is oriented to the sensibilities of people, productivity management struc-

(Continued on Page 22)

'Control 2000' Data Dictionary Ties Into 'System 2000' DBMS

AUSTIN, Texas — Control 2000, a data dictionary package to be released early next year by MRI Systems Corp. for its System 2000 data base management system (DBMS), will be expanded "in the very near future" into the area of overall system and project control, according to MRI.

The package "somewhat rounds out" the company's basic plans for data base management using System 2000, he said. The system now includes a host language interface supporting application programs in Assembler, Cobol, Fortran and PL/1, an update and query language and a teleprocessing monitor — TP 2000 — in addition to System 2000 and Control 2000, a spokesman noted.

In its early release form, Control 2000 is said to provide all the facilities traditionally associated with a data dictionary, including accumulation of information about data fields and records, schemata, reports, programs and data base definitions, he added.

Standard reports showing the interrelationships of the various entities are provided along with one-time "what-if" or data base modification impact reports. In that way, Control 2000 provides data base administration facilities for both data bases and conventional files, MRI noted.

Since Control 2000 is itself a System 2000 data base, the information generated by the dictionary package can be accessed and manipulated by the query and update language of the basic DBMS, the spokesman added.

System 2000 has been implemented on IBM 360/370, Control Data Corp. 6000 and Univac 1100 mainframes. It ranges in cost from $30,000 to $125,000 depending on features and options selected.

Like the TP 2000 monitor, the initial release of Control 2000 can be used only in an IBM setting, MRI said.

The dictionary package costs $15,000. MRI can be reached through P.O. Box 9968, Austin, Texas 78766.

'Wang/3' Puts Payroll on IBM 3

LOWELL, Mass. — Full support including program updates when taxing jurisdictions change their requirements was cited by Wang Laboratories, Inc. as one of the features of Wang/3, a payroll package for the IBM 3 user.

The package was designed to handle all the conventional functions of a payroll system, including an "unlimited" number of payroll groupings, 10 categories of earnings and more than a dozen different deduction categories for each separate pay group.

Wang/3 routinely produces payroll checks, check registers and other management information reports as well as quarterly 941A reports for Social Security and W-2 forms for each employee at the end of the year, Wang noted.

Special reports based on any information in the master file can be put together with the system's report generator.

Multiple jurisdictions are supported by Wang/3 including U.S. federal, state and lower — New York City, for example — income tax procedures. Even Puerto Rico and the Virgin Islands are covered by Wang/3, a spokesman noted.

Wang/3 currently includes a direct deposit payroll capability enabling a using company to forward payments to an employee by electronic transfer of funds to a bank specified by the employee. Wang guarantees continual compliance with National Automated Clearinghouse Association specifications, the spokesman added.

The payroll system is written in ANS Cobol and can be run on IBM 3 configurations that include IBM 3340 or 5445 disks. The package costs "less than $18,000" and can be ordered from Wang's Program Products Division, One Industrial Ave., Lowell, Mass. 01851.

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Fixed Asset Package Modified

ATLANTA — The Fixed Asset/Property Accounting System now available from Management Science America Inc. (MSA) is more compact in terms of programs and more extensive in terms of facilities than MSA's previous system, according to a spokesman.

The repackaging includes only three programs and two files, he said, compared with the 11 programs MSA once used.

The system still provides accounting information concerning depreciation, property status and expense data; it performs calculations for standard depreciation methods plus units of production, with automatic switching at the optimum point, he claimed.

The system maintains seven sets of books for financial, tax and regulatory reporting.

Said to be of "great current interest" to many clients is the Insurance Reevaluation Module, which calculates both current asset replacement and insurance values.

These can be "extremely useful" in purchasing realistic insurance coverage and reporting replacement costs to the Securities and Exchange Commission, MSA said.

While the system generates a range of standard reports and government forms on a regular basis without outside intervention, a Special Report Generator provides flexibility to meet one-time needs. With this feature, users can prepare "any report with any format, any headings, totals, parameters and sequence desired," the vendor said.

Written in ANS Cobol, the software is available for use on IBM 360/370s and Burroughs equipment.

MSA at Suite 1300, 3445 Peachtree Road N.E., Atlanta, Ga. 30326.

Datapoint-to-Syfa Shift Eased

IRVINE, Calif. — A translation package now available from Computer Automation, Inc. (CA) simplifies the conversion of online applications from Datapoint to CA equipment, the vendor said.

Called Uhuru, the package converts Datashare and Databus source code to CA's Sybol for use on Syfa systems.

Syfa systems were designed specifically for distributed processing applications. The Syfa Concurrent Logic Operating System (Syclops) supports the simultaneous execution of 24 interactive applications, synchronous communications to a mainframe, dual print spooling jobs and 16 background utility programs, a spokesman added.

A typical environment in which conversion from Datapoint to Syfa would be most effective, he said, would include the need to increase memory to as much as 304K, the number of terminals to 24, the number of printers to two and disk storage capacity to 640M bytes.

Although automating the conversion process reduces the programmer effort that might otherwise be involved, Uhuru still requires appreciable time for its handling of the work; CA estimated approximately 30 minutes are needed to convert a Datapoint source program to Sybol.

Uhuru is offered free to Syfa system users who have Datapoint programs on Syfa-compatible media, CA said. A media conversion service — "at a nominal charge" — is also available from CA, the spokesman added from 18651 Von Karman, Irvine, Calif. 92713.

DP Concepts Covered In Auditors' Course

KANSAS CITY, Mo. — "EDP Essentials for the Auditor" is a 56-module course now available from the Edutronics Group.

Twelve separate units, each a series of course modules, cover a range of subjects — to support both internal and outside auditors, a spokesman added.

Available in "Super 8mm" film, 16mm film and 3/4-in. videotape cassettes, the course may be purchased or leased from the Edutronics Group at 3435 Broadway, Kansas City, Mo. 64111.

Revised Development Ends Firm's Chaos

(Continued from Page 21)

tures itself in many ways that are completely opposite from conventional management theory. For example:

- The final systems test plan must be completed in detail even before general system design is begun, an apparently impossible task until one realizes it represents the ultimate in goal setting.
- Picking the development team is a requirement that must precede any effort to define time and costs.
- Complex flowcharts, systems schematics and Pert and Gantt charts — considered de rigueur in innumerable development projects — are banned. Only simple-to-understand "organization-like" charts are allowed.
- No task in a project — even if the total project is a year-long, 20-person development effort — is permitted to take longer than two man-weeks from start to finish.

Remove Hassles

All of these seeming contradictions not only work, but they virtually remove "all of the hassle, confusion and anticipation of disaster" that characterize so much software development work, Frank claimed.

The entire theory is based upon six principles which, when listed, seem simple and obvious. When employed within the Keane system, however, they impose a totally new level of awareness, responsibility and "binary decision making" — that is, "it's done or it isn't" — on every small step in the development effort.

"Managing within tightly defined boundaries makes managing easier. You're not faced with massive decisions at any point, just one continuous flow of easy choices," Keane explained.

Six Key Rules

Productivity management's six rules of thumb are:

1. Define the job.
2. Assemble the right people.
3. Estimate the time and cost.
4. Impose the 80-hour rule.
5. Encourage changes of specification.
6. Establish acceptance criteria.

Within these rules is a carefully developed web of relationships and structures that gives productivity management its clout.

The next article in this series will describe in detail the reasoning behind the sequence of the phases in productivity management and the amount of work Keane Associates expects to get done in each of the phases.

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Cobol Program With PERFORMs Doesn't Have to Be Inefficient

By Drew Bourrut

Special to Computerworld

Concepts and Techniques

It should be the goal of every DP installation to increase productivity by eliminating inefficiency. A problem arises, however, when we try to define what we mean by inefficiency.

Stephen Wright, in his article on the Cobol PERFORM verb [CW, Nov. 29], said in reference to structured programming and the use of the PERFORM verb as part of hierarchical control: "This technique . . . is meeting with some resistance because of the costs in time and space."

Question for a Question

I agree that the Cobol PERFORM verb as presently implemented by "linkage mechanisms" does, in many instances, cause some increase in run time and core storage requirements and therefore that linkage mechanism is inefficient.

But does this mean a structured Cobol program replete with PERFORM verbs is inefficient?

In order to answer this question, another question must be asked: "What makes a good (efficient) program?" There are four factors which must be a part of every good program.

First, a good program must be accurate. That is, it must do exactly what the specifications demand.

A structured program is more likely to be accurate because it is easier to see exactly what the program is doing as it is being built. Also, it is easy to check for accuracy through structured testing techniques.

Second, the program must be predictable. Unless I can predict the effect when given a cause, my program is unpredictable and I can never be sure it will do tomorrow what it does today.

Third Criterion: Maintenance

Third, the program must be easily maintainable. Good programs as well as bad require maintenance from time to time and it should be reasonably easy to do that maintenance.

Finally, a good program should be reliable. Like a good car, it should not continually break down. If it does, it is not reliable.

Because of its functional orderly approach, structured programming allows the programmer to produce a better, more efficient program. It is easy to see a structured program is more efficient than an unstructured one by noting just one thing – people are now more expensive than computers.

In addition, consider how many one-time "quickie" programs grow up to be the granddads of the installation, haunting it forever.

Because programs last so long, if a program is accurate, predictable, maintainable and reliable, then it should be of minimal consequence that the PERFORM Implementation is inefficient.

Bourrut is president of Bourrut Consulting Corp. in Smithtown, N.Y.

Workshops to Cover Performance Auditing

ROCKVILLE, Md. – Keston-Barnett Associates will offer a series of workshops on "How to Conduct a Performance Audit of Your Computer System" in several major cities after the first of the year.

The workshops are aimed at upper level managers responsible for DP, DP auditors and DP staff with cost responsibilities, according to consultant Arnold Barnett.

The sessions will cover evaluation techniques including the traditional area of equipment utilization as well as software, personnel, systems development, application effectiveness, quality control, reliability and organization.

Sites of Sessions

The workshops will be held in Washington, D.C. on Feb. 7-11, March 7-11 and May 2-6. Newport Beach, Calif., will be the site for a workshop Jan. 17-21; another will be held in San Francisco March 21-25; and New York will be the location April 18-22.

The five-day course costs $595, which includes curriculum materials and lunch each day.

Keston-Barnett Associates is at Suite 603, 1010 Rockville Pike, Rockville, Md. 20852.

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A Way to End Discrimination

Seen as Machine, Software's Image May Improve

By **Martin A. Goetz**
Special to Computerworld

Discrimination in America is nothing new. Traditionally, the conflict has been between the "haves" and the "have nots." Those in power want to stay in power. Those on the outside want to get inside.

Software companies have been viewed as existing merely to help hardware companies build software or to work with users on improving hardware performance. The hardware and the hardware companies were the focal points.

You pay for hardware and you get a lifetime supply of software free. That was the sales pitch prior to 1970 and still is for some hardware manufacturers. Their position has been that software is in the public domain and, consequently, should be freely exchanged without being considered anyone's property.

System control programming is different. That free, one-of-a-kind operating system is yours — gratis — except for a few strings. You must accept the bugs and inefficiency as the price for all those hard-to-measure but free facilities.

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Viewed as Machine

The key to removing software discrimination lies entirely in the realization that software — like hardware — can be viewed as a machine.

According to *Webster's Dictionary*, a machine is an apparatus consisting of interrelated parts with separate functions, which is used in the performance of some kinds of work.

This past June, the Association for Computing Machinery (ACM) council voted to submit to the membership an amendment eliminating the word "machinery" from the association's name. Some believed it to be a poorly chosen word, not representative of the full range of DP activities.

While that argument may have some merit, "machinery" is a very basic word that could very well bring about a better understanding of exactly what DP is all about and why there has been so little "professional" or "quality" software developed over the last 20 years.

The term "software engineering" was coined about 1965. Since the early '70s, new ideas have appeared directly relating to building good software.

And, during this 10-year period, there have been court cases (even including Supreme Court reviews) to determine if "machine claims" are applicable to the protection of inventive software concepts vis-a-vis the patent system.

Today, most literature describes a computing machine as being constructed of elements of hardware, elements of software and elements of firmware.

It is only when one takes the position that the software component itself is a machine (or a machine part) that eyebrows and voices are raised by numerous skeptics.

In fact, software is a complex undertaking that very clearly parallels the building of hardware machines (or the hardware component of the computing machine).

The Hardware Machine

Traditionally, the building or developing of a "hardware machine" — from its conception through the assembly-line checkout to its operational acceptance — reflects a continuous flow of accepted steps, including design, engineering, implementation (manufacturing), computer testing, operational prototype, quality control testing, production model and maintenance.

Software, especially commercial applications software, is not always developed or maintained in such a systematic manner.

Since a sound commercial application must reflect a corporation's changing and growing requirements, the operational application is generally subject to continual modification and enhancement. Therefore, it is even more critical that software be systematically built so it can subsequently be systematically maintained.

Building, Engineering Tools

The building of anything, be it a house, hardware or software, cannot be done well without proper tools. Tools can not only cut costs and save time, they can also improve the quality and reliability of the end product.

Since 1970, the number of software tools available to users has increased significantly. But, most users — even though experiencing productivity gains — still do not recognize the software they are constructing as a machine.

With the introduction of new software tools in the early '70s, a new emphasis has been placed on how to build and maintain software.

Professionally engineered software, like professional hardware, would be developed with reliability, efficiency, maintainability, standardization and quality considered essential to the finished product.

The Payoffs

What does all this mean to the DP community? Structured programming and structured design represent only the first step toward building software in a disciplined manner.

A recent Applied Data Research, Inc. survey of active users of software tools showed there have been productivity gains of up to 200%, with average gains ranging about 100%.

Translated into dollars, this means software costs can be reduced by at least 50% and as much as 67%.

Goetz is senior vice-president of Applied Data Research, Inc. in Princeton, N.J.

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CPM Program Can Boost Productivity, Reduce Costs

By Larry E. Hart
Special to Computerworld

Today's corporate and DP managers are vitally concerned with using each computer system to its fullest. Data centers are finding they need the skills of the computer performance evaluation (CPE) technician, yet even those skills aren't really enough.

Performance Evaluation

CPE must be used as the basis for at least a limited form of computer performance management (CPM).

Rising DP costs must be controlled, and extending useful life is a primary cost control mechanism. For example, if a company leasing computer A at $25,000/mo can delay the acquisition of computer B at $40,000/mo for an 18-month period, then the net savings – $15,000 multiplied by 18 – is $270,000. This is a direct dollar savings that can be attributed to a performance program.

The typical process of acquiring a new system starts when, by some evaluation procedure, a company determines computer A can no longer accomplish the required tasks.

This decision may be based on a decrease in throughput, an increase in turnaround time or the fact that the system is running three shifts per day seven days per week and there is still work to be done.

The company then determines computer B will solve its problems and meet its requirements. This may be as a result of simulations or other user experiences; in some cases, computer B may be chosen because it is the next system in the vendor line and, by vendor statistics, is x times faster and more efficient than computer A.

Cost Benefits of CPM

Without CPM, this selection process often results in extremely short-term solutions because the performance bottlenecks on system A were not solved, but only passed onto system B. This selection technique always results in increased DP costs.

With a CPM program, cost savings can result from extending the useful life of system A. The first step is to conduct or to commission a system performance study to identify the present resource utilization, workload, productivity and performance bottlenecks.

If immediate action is required and no formal in-house performance program exists, the most cost-effective method is to hire an outside consulting company for this study. In-house efforts require a lead time of at least six months for staff training before they become truly operational and beneficial; an outside consulting company can bring rapid results as well as train an in-house staff for future efforts.

The next step is to tune the system based upon the performance recommendations of the study. This process must be an in-house function – any changes to the system, operations or user programs must be made by in-house personnel to maintain both credibility and continuity for future support.

Once the tuning is complete, a follow-on study should reevaluate the performance criteria, determine if bottlenecks have been eliminated and predict the amount of time actually added to system useful life.

This is done by reviewing reserve capacity for all resources, predicting a growth rate and identifying when and where resource saturation limits will be reached. The result is a plan identifying future needs for either equipment or tuning efforts.

Some typical tuning efforts include file reorganization, device reallocation, program optimization, modification of certain system parameters and workload shift balancing. These efforts often result in a reduction or even elimination of new equipment requirements and almost always result in a direct cost savings.

Upgrade Justification

Justification for equipment upgrades directly results from performance management. Every system has practical limits and saturation points which, when reached, eliminate the need for all tuning efforts. Only so much work can be processed by a given system.

Without CPM, justifications for upgrades are strictly subjective and management approval is often difficult to obtain. With CPM, equipment requests are based upon actual need, i.e., saturation points, and are thereby justified, resulting in management approval.

The evaluation criterion for productivity depends solely upon each DP center's environment, but may be defined as more jobs per day, more transactions per hour, shorter turnaround time per job or shorter response time per transaction.

Without CPM, increased productivity is typically accomplished by adding shifts, people or new equipment, resulting in significant increases in cost.

CPM, however, provides increased productivity by discrete system tuning efforts and continuous performance management efforts designed to meet the productivity requirements of each DP center.

Indirect benefits include savings in executive and other user personnel time by providing quicker reports, more access to information or faster response on terminals.

Cost reductions, defined previously through extending useful life and reduction of work shifts, also include reductions in equipment and/or personnel.

The types of cost reductions desired depend upon the objectives of each organization. Some companies wish to maintain surplus equipment as reserve capacity for future growth; others wish to reduce costs as far as possible.

CPM allows the consolidation of multiple mainframes, elimination of some peripherals and/or control units, elimination of extra shifts and negotiation for longer term leases and lower monthly costs.

Without CPM, DP costs will continue to rise as demands increase. With performance measurement, costs can be controlled and reduced. Discrete performance tuning efforts and continuous performance management enable DP management to maintain the optimal configuration mix and operational status to provide desired services at minimum costs.

Hart is the manager of performance services at CACI, Inc.-Federal, Reston, Va.

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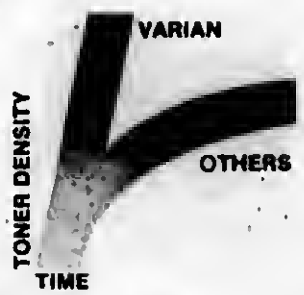

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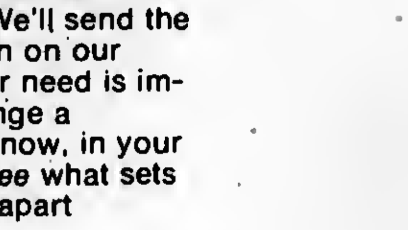

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Data Briefs

Terminal Controls Devices Interfaced With IEEE Bus

CONCORD, Calif. — The Model 3530 controller terminal from Systron-Donner Corp. allows a user to control instruments and computer peripherals connected to an IEEE bus.

The 3530 is a microcomputer-based CRT/keyboard terminal that also includes a tape cartridge drive, 16K bytes of memory, monitor read-only memory and IEEE 488, teletypewriter and RS-232C interfaces, according to Systron-Donner.

Software of the Model 3530 is interactive Basic with mathematical functions, string variables, syntax error responses, immediate and deferred modes, editing, debugging and subroutine features, the company said.

The controller terminal costs $5,950 from the vendor's Data Products Division, 935 Detroit Ave., Concord, Calif. 94518.

Livermore Drops Coupler Price

LIVERMORE, Calif. – Livermore Data Systems, Inc. has dropped prices on its RS-232-compatible Model 76B acoustic coupler ordered in quantities of 50 or more.

Prices have been lowered from $245 to $180 each in quantities from 50 to 99; from $210 to $170 for 100 to 249 units; and to $29 for each unit in quantities of 1,000.

Livermore is at 2050 Research Drive, Livermore, Calif. 94550.

Price of AJ 841 Reduced

SUNNYVALE, Calif. — Anderson Jacobson, Inc.(AJ) has reduced the price of its AJ 841 interactive remote computer terminal.

An AJ spokesman said the terminal previously cost about $3,000 and now costs $995.

A built-in modem and an acoustic coupler can be purchased for another $75, he said from 1065 Morse Ave., Sunnyvale, Calif. 95131.

Business Executives Get Newsletter

CHERRY HILL, N.J. – Management Information Corp. (MIC) has a data communications information service aimed at the business executive.

The *Datacomm Awareness Report* is said to be a user-oriented monthly newsletter designed to help the executive, DP manager, telecommunications manager and others cope with data communications technology.

The report, first published last month, is available for $70/year from MIC at 140 Barclay Center, Cherry Hill, N.J. 08034.

Survey Results Indicate

Terminal Users Pleased, Not Thrilled

DELRAN, N.J. — Prospective users of remote batch terminals (RBT) should expect good — but not great — overall performance from major vendors' terminal offerings, the results of a recent survey indicated.

In its latest report, "All About Remote Batch Terminals," Datapro Research Corp. here found users of Comterm Ltd. RBTs were most pleased with those terminals' overall performance while all 250 users surveyed gave their RBTs an average overall performance rating of 3.2 points on a four-point scale.

The Datapro survey drew 399 responses from users with a total of 1,771 installed batch terminals in large part from 18 vendors. The users were asked to rate their terminals' overall performance, ease of operation, hardware reliability, maintenance service and software and technical support with a rating of 1 for poor, 2 for fair, 3 for good and 4 for excellent.

The Comterm terminals (3.5) were followed closely in the category of overall performance by those of Data 100 Corp. with a rating of 3.4 and CMC Division of Pertec Computer Corp., IBM and Sycor, Inc., which tied for third place with ratings of 3.3.

Ratings for the Comterm RBTs, however, were based on three users' responses for as many terminals; Datapro cautioned prospective buyers should note that small sample sizes for some models and manufacturers "make it unwise to draw conclusions from the indicated ratings."

In the area of overall performance, no terminal received a rating lower than the 2.0 given to the Burroughs Corp. DC 1100, although Burroughs terminals scored well as a group with a 2.9, the Datapro report showed.

Data General Corp.(DG) with its Nova 2/10 and Mohawk Data Sciences Corp.'s RBTs took top honors for ease of operation, with ratings of 3.6 each.

Runners-up in this category were Comterm and Data 100 devices, gathering ratings of 3.5 and 3.4 respectively, while Datapoint Corp.'s units and those of Four-Phase Systems, Inc., Harris Communications Systems, Inc. and Sycor were given scores of 3.3, according to the report.

Users of IBM equipment rated their 619 terminals below the 3.2 average for all terminals with a 3.1 overall score on ease of performance, the report noted.

DG's Nova 2/10 also received the highest rating from users of the four RBTs represented with the only perfect score in the area of hardware reliability.

Ratings of 3.3 were given to the IBM and Sycor terminals, while third place in hardware reliability was gathered by Four-Phase and Data 100 terminals with ratings of 3.2 each, the report said.

The three Comterm terminals represented in the survey were given the highest score for maintenance service — 3.5 — and IBM RBTs were close behind with a score of 3.3.

According to survey results, software and technical support of vendors' RBTs were rated lowest by all users with a rating of 2.6 overall. The two highest scores in this category were Datapoint's 1100 and 2200 models and Data 100's terminals, which received ratings of 3.0 and 2.8 respectively.

IBM units were rated third by its users (2.7), while equipment produced by Digital Equipment Corp. (the PDP-8 and PDP-11) and CMC/Pertec received the average mark of 2.6, the report said.

The Datapro report also contained detailed specifications of 109 "terminals" from 43 vendors, including the DEC PDP-11, IBM 360/20, NCR 499 and other "free-standing processors."

Datapro noted that while these devices don't fit in the classic mold of batch terminals, they typify one of the directions that communications is taking.

"Increasingly, it is becoming difficult for manufacturers to market any level of computer system without some sort of capability to transmit volumes of data; i.e., a remote batch transmission capability," Datapro explained.

Usage Patterns

Turning to usage patterns, the report said a majority of RBT users had IBM CPUs in the 370/155 category or larger.

IBM 370 mainframes smaller than the 155 accounted for 22.8% of the 415 computers mentioned by users surveyed.

The principal application of each terminal was dedicated batch processing, accounting for 76.2% of users' responses; 45.6% of the users said they utilized a transmission speed of 4,800 bit/sec.

The higher 9,600 bit/sec speed was one percentage point ahead of 2,400 bit/sec with 24.1%, the report said.

A majority of users employed leased voice-band communications facilities (59.4%), while dial-up lines comprised the remaining bulk of facility type with 40.9% of the survey responses, according to the report.

The 35-page report is available from Datapro at 1805 Underwood Blvd., Delran, N.J. 08075.

RJE Subsystem Links HP 1000 With Batch-Oriented 360/370

PALO ALTO, Calif. — Hewlett-Packard Co.(HP) has introduced a remote job entry (RJE) subsystem which allows the recently introduced HP 1000 series of computer systems to communicate with IBM 360/370 batch-oriented CPUs.

The RJE/1000 (HP 91780A) cassette tape software/hardware package increases the HP 1000's distributed processing capability by giving the remote user the power of an IBM batch system for large-scale computation and report generation and allowing large-scale data storage, according to an HP spokesman.

RJE/1000 works with the HP system under RTE II and III operating systems in a true multiprogramming environment that allows concurrent program development, computatioo and data acquisition while communicating to the larger batch computers, the spokesman explained.

Retrofits Possible

The RJE package can be retrofitted to operate in several other HP 2100- and HP 21MX-based systems, he added.

All peripherals such as line printers, magnetic tape units, disk drives, card readers and CRTs can be used as RJE devices to the IBM systems, communicating through modems at speeds up to 9,600 bit/sec, the spokesman claimed.

Using the IBM binary synchronous communications (Bisync) protocol, data is transmitted over dial-up or leased lines in either half- or full-duplex mode.

Special RJE/1000 features include Ebcdic transparency, auto turnaround, auto answer, multirecord transmission and end of media, he said.

RJE/1000 offers a choice of Ebcdic and Ascii code sets and can operate directly with Hasp in IBM's OS operating system.

The HP RJE subsystem costs $4,500. HP is at 1501 Page Mill Road, Palo Alto, Calif. 94304.

Interconnect Switch Offered

SUTTON, Neb. — Counterscan Systems has introduced a high-density interconnect switch which can interconnect any two of 256 data channels, the vendor said.

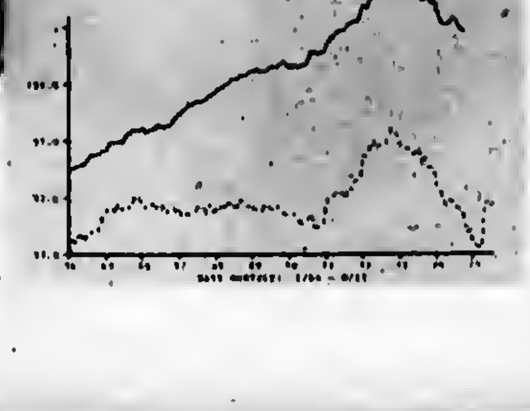
CMOS LSI transmission gates switch the channels when supplied with an address for each channel, according to Counterscan.

Complete address coding and address retention is included with the switch; the address interface reportedly is compatible with any addressing system.

Address selections may be changed up to 1 mHz; the switches will pass analog and digital data to 1 mHz at amplitudes of 30 volts, Counterscan said.

The interconnect switch sells for $1,600 from the company at P.O. Box 536, E. Highway 6, Sutton, Neb. 68979.

ULTRAPLOT... something to talk about



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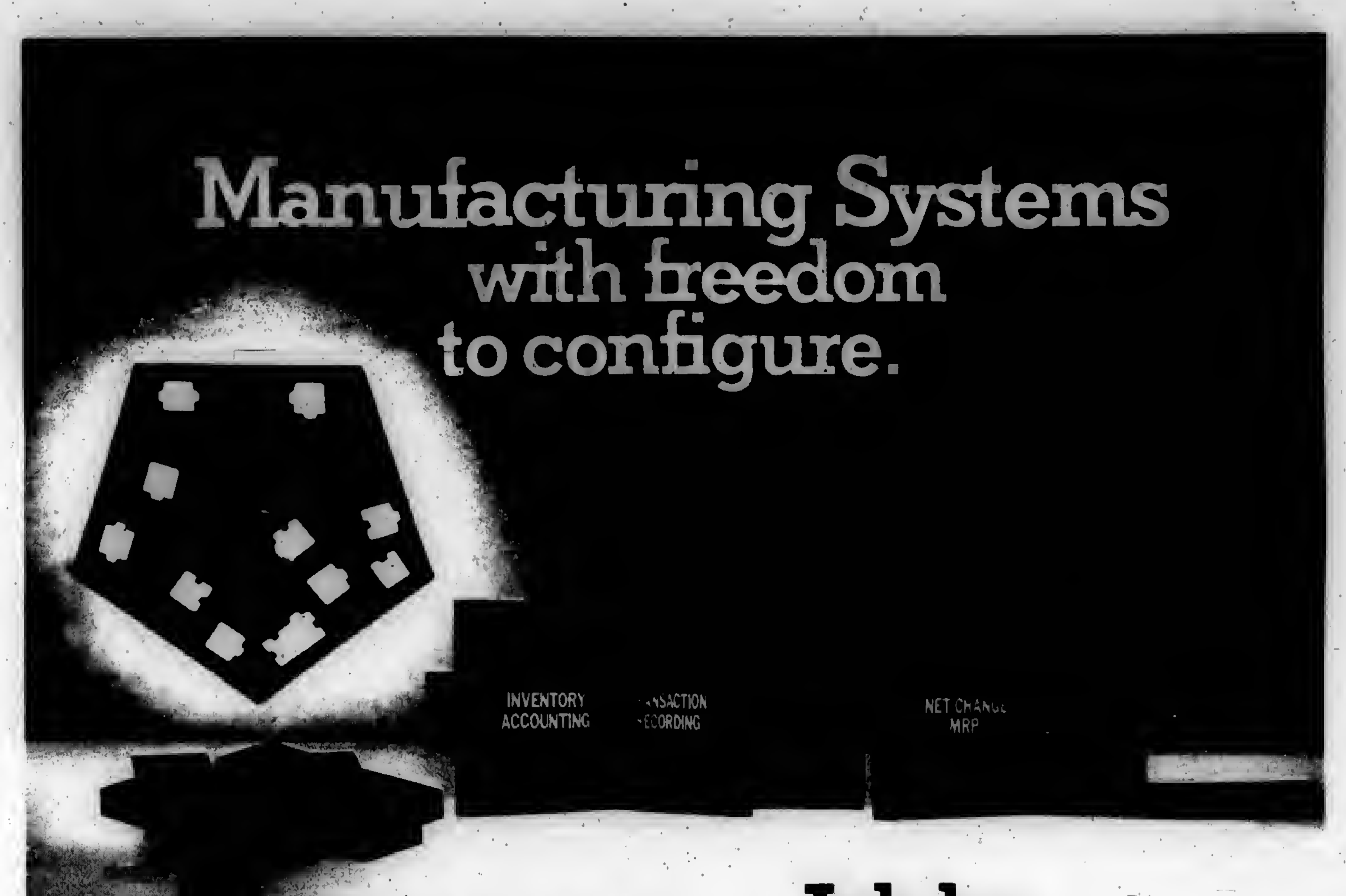

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MAS provides a **COST EFFECTIVE** way of achieving a proven functionally viable system for as little as 80¢ per line of code, including full documentation. Budgetary flexibility is enhanced as you select, implement and purchase your systems at *the job level.*

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ASC Designs Controllers For DEC, Other Equipment

ST. CLAIR SHORES, Mich. – Applied Systems Corp. (ASC) has introduced two communications controllers, one for Digital Equipment Corp. Decwriter terminals and the other for other vendors' equipment and networks.

Both ASC controllers utilize the Intel Corp. 8080 microprocessor systems and offer programmability and, in the case of the DEC terminal controller, buffer memory, ASC said.

The ASC unit for DEC LA36 or LA180 terminals controls communications with data networks operating at data rates up to 9,600 bit/sec using asynchronous or synchronous modems or computer interface adapters, the company said.

It provides communications protocol control, code conversion/editing and local DP or custom programming functions for one or more Decwriter terminals. It includes line adapters plus optional peripheral interfaces for CRTs, floppy disks or tape cassettes, ASC said.

A modular system architecture permits on-line operation of DEC terminals with medium- or high-speed networks. The controller provides optional features for multiple terminal clustering, block record transmission, error checking and modem control, the company stated.

Additional Features

ASC's Decwriter controller also features system compatibility for several communications line protocols by incorporating optional firmware routines for time-sharing, TWX, Telex, Decnet and IBM Bisync networks or others on either private-line or dial-up facilities.

It provides dedicated line control functions with interface capability for Bell and Bell-equivalent modems, although internal modems are available as a system option, according to the firm.

A multitasking executive program, special communications protocols and terminal control routines are also implemented in programmable read-only memory (Prom) firmware or can be executed from random-access memory (RAM), the spokesman noted.

In addition, he said, buffer storage and application program memory is available using RAM modules of 256 words up to 64K words.

The ASC controller for general equipment is also modularly designed for on-line operation with medium- or high-speed communications networks and incorporates interfaces for dial-up lines or private-line polling systems, he added.

It reportedly performs automatic control and buffering for one or more terminal devices. Optional analog and digital I/O is offered, ASC said.

This controller utilizes nonvolatile Prom for dedicated line control, operations and special communications protocols or station call routines.

RAM data buffer storage of 1K words is standard; options extend the storage to a maximum of 16K words, the spokesman added.

Typical terminal data rates include 110-, 300-, 1,200-, 2,400- and 4,800 bit/sec, with special features available.

The ASC controller for Decwriter terminal networks is priced at about $950 with nominal RAM. The controller for general equipment costs about $1,000, he said from 26401 Harper Ave., St. Clair Shores, Mich. 48081.

Multiplexer Links Terminals, PDP-11

OGDENSBURG, N.Y. – Up to 12 terminals or other peripherals can be interfaced directly to the Unibus of a Digital Equipment Corp. PDP-11 minicomputer with the GDS-2900 multiplexer system introduced by Goodwood Data Systems, the vendor said.

The GDS-2900 is a modular I/O subsystem allowing any RS-232-compatible asynchronous peripheral or terminal to interface up to four ports on the mini's Unibus either directly or through a modem, according to a Goodwood spokesman.

The multiplexer systems can be equipped for as few as four lines and can be expanded to the full 12-line capability in groups of four, he said.

Features such as the total number of data bits, stop bits, parity bits and line speeds – from 75- to 9,600 bit/sec – are all link-programmable for each individual line, the spokesman noted.

No line adapters or other equipment are needed for the GDS-2900 because modem control functions for Bell 103- and 202-type modems are a standard feature on all lines, he claimed.

A GDS-2900 master unit serving up to four ports on the PDP-11 costs $1,485; a second slave unit with additional four-port capability costs an additional $970.

Goodwood is located at Box 768, Ogdensburg, N.Y. 13669.

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Things really bloomed when you first put your 3270 on line.

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Net Gets Crime Data to 'New York's Finest' Faster

By John P. Hebert
Of the CW Staff

NEW YORK — A computerized terminal communications system is making the jobs of New York City's uniformed officers easier by providing current information on criminal activities on city, state and national levels within one minute.

The New York Police Department's (NYPD) citywide Field Administrative Terminal Network (FATN) is also expected to save the department $510,000 annually in reduced labor, telephone and teletypewriter costs, according to Gene Snailer, FATN coordinator.

About 200 of the proposed 300 Olivetti Corp. TCV270 cluster-type CRT terminal systems with buffered printers have been installed in the NYPD's 73 precincts, seven area commands and certain administrative units.

The terminals are linked to dual IBM 370/158s which act as front ends to control the communications network and house the department's management information system (MIS), Snailer said.

Linked to Two Capitals

The network enables units within the department to communicate directly with each other and with a variety of law enforcement agencies in Albany, N.Y., and Washington, D.C.

Requests for information from agencies outside the NYPD are centralized through one Olivetti terminal to access Teletype Model 28s in Albany at 2,400 bit/sec over private lines, Snailer said.

No dial-up lines are used in FATN because "there's no way we can have chinks in our armor."

Through AT&T Dataspeed 40 terminals at the Albany-based New York State Police Inquiry Network, FATN users from the central location here can access the New York State Department of Criminal Justice Services file on all wanted criminals; the state Department of Motor Vehicles for drivers' licenses and registrations; and the Federal Bureau of Investigation's National Crime Information Center (NCIC).

The FATN terminal can also access the National Law Enforcement Telecommunications System and gain information on drivers' licenses and automobile registrations in 40 states; the network also connects NYPD's precincts and departments with the Special Police Radio Inquiry Network and the NYPD on-line management information system's programs and data.

Fast Inquiry Response

An officer in the station house can query the data banks directly and get a response in about 30 seconds, Snailer said.

Before FATN was operational, an officer had to make two phone calls for information, one to the General Warrant Division and one to the Identification section and then wait for call-backs from these units, which took between 30 minutes and two hours at times, he noted.

Aside from its faster inquiry response, the system has the capability for point-to-point message switching and to broadcast administrative messages; it also allows access to other NYPD systems, such as tracking and batch printout of "911" calls.

The dual 370/158 processors operate with a telecontroller system manufactured by Action Communication Systems, Inc., modems from Intertel, Inc. and lines supplied by New York Telephone.

Terminal Transactions

An Intertel Model 500 centralized modem rack with a built-in network tester at the central site monitors each communications circuit and each station on the circuit so FATN users can see exactly where a problem may be, which Snailer said is very helpful in trouble shooting.

'Not Me' Problem

The Olivetti TCV270s and all other equipment on the network was chosen as a result of competitive bidding in 1973.

There were — and still are — the honest everyday problems of bringing and keeping up a communications network, although the biggest problem was the vendors saying "not me" when the small problems occurred, Snailer said.

"We got everybody to sit down and talk it out."

All of the vendors had problems, even though there was a lot of planning, site preparation and testing of the installed network, he added.

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Saves $500,000 in Carrying Costs

Sycor Borrows From Own Stock for Inventory System

ANN ARBOR, Mich. – With more than 15,000 part numbers including 1,000 manufactured items in its inventory, a manufacturer of computer terminals here faces many of the same problems as users.

Sycor, Inc. uses its own terminals, of course, in its in-house materials requirements planning (MRP) system. The system has reduced inventories and allowed the company to be more flexible, according to a Sycor spokesman.

And the terminal system has saved the company $500,000 in carrying costs – a direct result of turning the company's inventory over more quickly, he said.

"In a business like ours, for every $1 million you have in inventory, it takes nearly $250,000 a year in carrying costs to keep it there," Dick Phillips, vice-president of operations, explained.

"We've already been able to turn over our $12 million inventory another half-time a year since we initiated the program," he said.

The $50,000 MRP package from Software International runs on an IBM 370/135 with 512M-bytes on eight IBM disks and three tape drives.

Information on the firm's overall hardware requirements for the next six months as well as data on spare parts, supplies, options and peripherals needed is entered and edited for accuracy through six Sycor Model 340 terminals on-site in the manufacturing facility, the spokesman said.

Terminal Transactions

The information is then manipulated against a data base of bills of materials and a product structure file entered by the manufacturing engineering department which shows assemblies and subassemblies, he said.

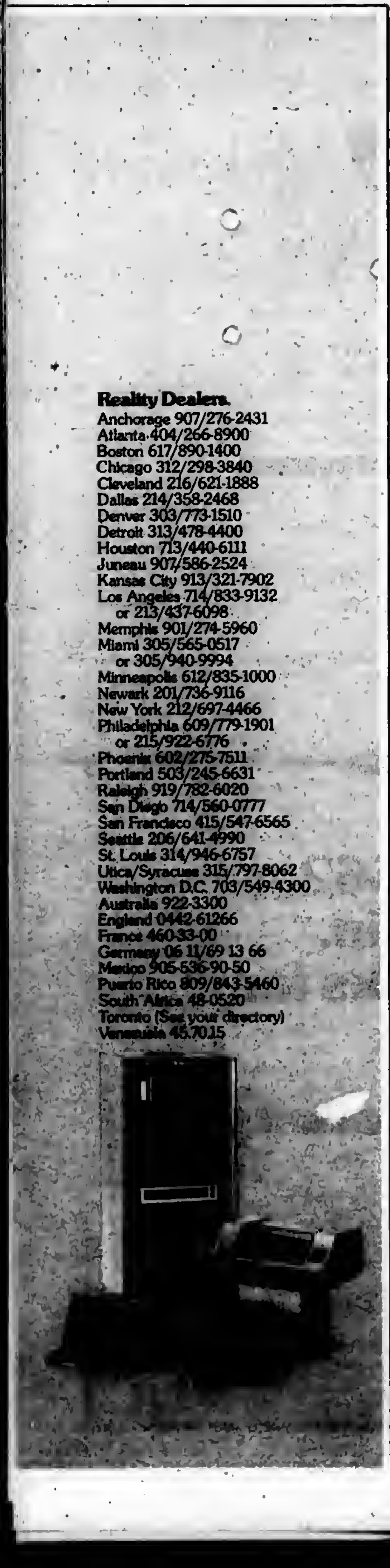
Information is updated once a day by Model 340 terminals in the receiving area. Once items are received, the information is entered on the terminals with flexible disk options in the stocking area.

Exception reports produced as a result of the system help keep priorities straight, according to Marshall Smith, director of materials.

The system has given the company more control over its inventory so it can "act rather than react" to changing market requirements, he said.

"We still have shortages – and we probably always will because of engineering changes, vendor material problems, increased market demands or people simply forgetting to fill out the appropriate paperwork – but we are able to react faster in many cases and reduce the effect of delivery problems," he said.

The Sycor spokesman added there were very few problems with the system – and no problems at all dealing with the terminal vendor.



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Tektronix 4631 Gets Direct Print Option

BEAVERTON, Ore. – Tektronix, Inc. has a direct print option which it said allows alphanumeric information from a remote source to be transmitted via a Tektronix CRT terminal to a Model 4631 hard-copy unit, bypassing the terminal screen.

This reportedly enables the user to put five times as much data on one sheet of paper and to transmit it faster. It also allows multiple pages to be copied without operator intervention or CRT display disturbance, according to a Tektronix spokesman.

The direct print option can be used to receive information that originates either from a remote CPU or from an off-line source such as a Tektronix 4923 digital cartridge tape recorder, he said.

Prints at 787 Line/Min

With the option, the 4631 hard-copy unit can print at speeds up to 787 line/min with up to 13,440 characters per page. This can result in copy cost savings where the data transmitted is primarily alphanumeric, plus savings in time, the company claimed.

The direct print option has its own character generator which provides two character sizes: 128 characters by 105 lines or 85 characters by 53 lines. The small character size requires a minimum data rate of 12 kbit/sec; the larger character size requires 4 kbit/sec.

The price of the direct print option is $1,000. Tektronix can be reached at P.O. Box 500, Beaverton, Ore. 97077.

CRA Has Silent 700 Keypad

LONGVIEW, Wash. – Cascade Research Associates' (CRA) Model Four Keypad was designed for users of Texas Instruments (TI) Silent 700 computer terminals without numeric clusters and for users in need of separate numeric keyboards with special layouts.

Utilization of a numeric keypad can speed up operators' productivity about four times over using the numeric keys on TI models 732, 733, 735 and 742 terminals with Microswitch keyboards, CRA claimed.

There are eight standard keypad layouts for the Model Four including line feed, carriage return, period, comma and other symbols, as well as numbers zero through nine. Custom layouts are also available, the firm said.

Options include a long cord for remote operation and automatic keying sequences. Versions with either 16 or 20 key positions are available with four or five columns of keys respectively, CRA noted.

Prices start at $200 for one and $185 each for two Model Fours in the 16-key-position version. Installation reportedly takes 15 sec to 30 sec.

CRA can be reached at P.O. Box 534, Longview, Wash. 98632.

CDI Adds APL, Ascii Miniterms

BURLINGTON, Mass. – Computer Devices, Inc. (CDI) has introduced a series of Miniterm portable time-sharing terminals for Ascii and APL operation.

The Miniterm Model 1203-APL comes with a built-in acoustic coupler and carrying case. A three-way keyboard allows the user to choose upper/lower case Ascii, APL and numerics only, according to a CDI spokesman.

CDI's desk-top Model 1202-APL features switch-selectable dual fonts, allowing the user to opt for APL or upper/lower case Ascii operation depending upon output requirements.

A third terminal, the 1201-APL, is a read-only thermal printing terminal said to be designed for all applications involving CRT terminals.

The 1201-APL also features dual-font printing in the full Ascii or APL character sets and is compatible with the IBM 5100 small-scale CPU, according to the spokesman.

A 1203 costs $2,435 or $137/mo; the 1202 costs $1,835 or $97/mo; and the 1201 read-only terminal costs $1,635 or $87/mo.

CDI is at 9 Ray Ave., P.O. Box 421 Burlington, Mass. 01803.

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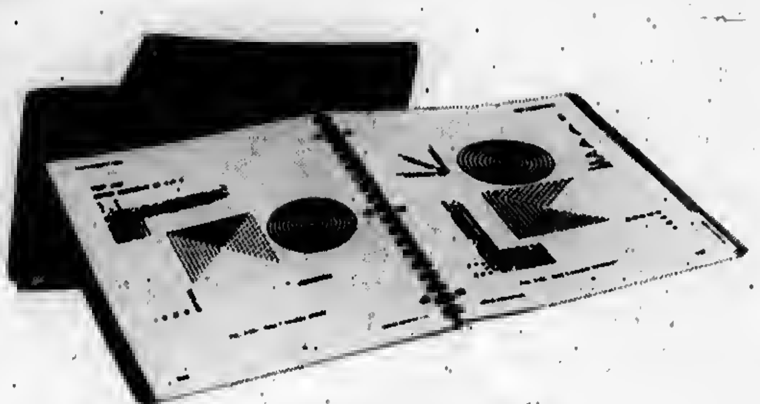

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The 4662 contains its own character generator, alpha rotation, and page scaling, thus minimizing support software. Proven graphic and plotter software is provided by Tektronix.

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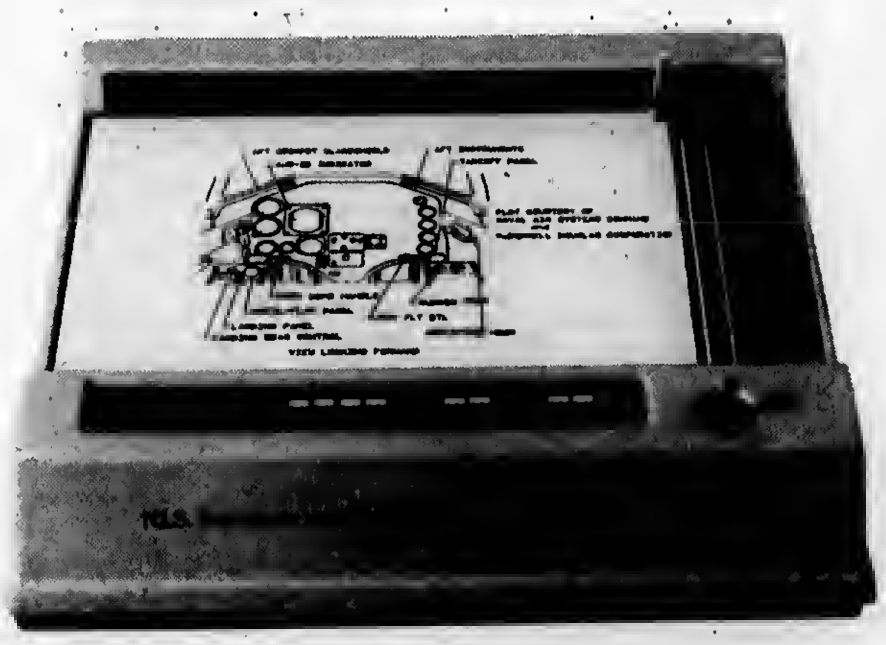


Anticipation – Not Reaction – Key to Security

By Ronald A. Frank
Of the CW Staff

HANOVER, N.H. — The key to effective security in computer systems is to anticipate abuses instead of reacting to them after they occur, according to Donn B. Parker, senior information processing analyst at Stanford Research Institute.

Parker, an expert on computer abuse, said the only way to build effective security into a system is to anticipate beforehand how it can be compromised. At a time when technology is advancing rapidly, our control mechanisms are lagging behind, he warned at a recent Dartmouth symposium on "Man and the Computer."

As society puts more of its valuable assets into computer systems, the incidence of computer crime increases because criminals go where the money is. And this will happen before the five or more years needed to develop more foolproof security systems, Parker said.

The applications most susceptible to computer abuse in order of importance are banking, education, government, manufacturing, insurance and computer services.

In six years of studying cases of computer abuse, 430 incidents were identified. These totaled a yearly loss of about $10 million to $15 million. The average case in which data is accessed by unauthorized means costs the system owner $450,000, he said.

"And as on-line systems develop, we will be moving the vault door closer to the criminal," he cautioned.

Most of the systems which were studied to rate the effectiveness of their security had problems with either the manual I/O systems or the physical access. What is needed is more intensive risk analysis to spot potential security problems, Parker said.

In some cases, a computer system was found to have excessive security clustered in one area, leaving other areas vulnerable. This requires a shifting of some security mechanisms within the system, he said.

Computer security today is a fuzzy area because there are no accepted standards; the completion of standard codes of good practice for computers would be a step in the right direction, he suggested.

In the future, the incidence of computer abuse will probably decrease, but the value of the loss per occurrence will probably go up, Parker warned, because the danger to the criminal will increase.

At the same time, the average system will be exposed to a higher value of crime because the size and value of data bases are growing.

As transactions and security procedures are automated, there will be less exposure of assets to compromise, and the incidence of computer crime will drop.

Reader Has 'Clipped Character' Feature

Burroughs Enhances S1000 Series With OCR

DETROIT — Burroughs Corp. has added optical character recognition (OCR) capability on its S1000 series of data capture, transmission and document management systems.

The S1000s previously handled only magnetic ink character recognition (Micr)-coded documents.

The OCR document-reading capability of the S1000 models will provide more accuracy and time saving in the encoding and processing of documents for financial, commercial, industrial and governmental users, Burroughs claimed.

The S1000 models with OCR will enable users to process a variety of documents including remittance advices, utility bills, insurance premium notices, credit card slips and banking vouchers. All relevant OCR information can be captured and proved with one handling of the documents in a single pass through the S1000 systems, the firm said.

OCR fonts that can be read by the S1000s include OCR A/1428, OCR B/1403 and Farrington 7B. The OCR models can read any two of these fonts in any combination, according to a Burroughs spokesman.

'Clipped Character' Feature

The OCR reader incorporates a "clipped character" feature which enables it "in most cases to accurately read and interpret partially printed OCR numeric characters as long as 80% of the character is present," Burroughs said.

When a character cannot be read, a hold-and-view station programmatically stops the document in front of the operator and the display screen indicates any "can't read" or missing data. The operator can then index the character which will be inserted into the data to be captured, the spokesman explained.

This correction is accomplished with no manual handling of the document. This ability to capture complete data at the original document pass significantly reduces the cost of processing OCR documents, Burroughs claimed.

Three Models, Three Media

The equipment range of the S1000 series extends from an operator-attended two-pocket encoder to an operator-monitored, 20-pocket item-processing system with automatic feed, document reading, data capture, data communications and microfilm recording.

The OCR systems are the S1700, S1800 and S1900. All of these models utilize an integrated system and data communications processor, the same processor used by Burroughs' B80 small business computer.

This processor has 8K-bytes of memory expandable in 4K-byte increments to 64K bytes.

All systems can transmit captured data to a central computer system by standard data communication methods, the spokesman added.

For storage of data captured during the document reading or encoding operation, the OCR models provide a choice of three media: one or two Burroughs minidisks, each with one million bytes of storage capacity; one or two industry-compatible minidisks, each with 243,000 bytes of storage or one to four magnetic tape cassettes, each providing 240,000 bytes of storage.

Microfilm Module

Burroughs also announced an in-line microfilm module for the S1000 systems which provides the ability to capture documents being processed through the system on film.

The 16mm film is cartridge-loaded in lengths of 100-, 200- or 400 ft. The images are reduced on film by a factor of 50 to 1 and recorded at an average density of 140 document/ft.

The operator console of the S1000 series has a 10-key numeric keyboard, a 21-column printer and an 18-character alphanumeric visual display for communications between the system and operator. A 25 char./sec Micr or OCR encoding module is available with all S1000 models.

An 85- or 160 line/min printer is optional on the S1000 systems. The printer can supply a hard copy of items processed on the S1000 and of all messages sent to the S1000 from a central computer system.

Each of the S1000 models with the OCR capability has "certain distinguishing features," Burroughs said. The basic S1700 has manual document feed, OCR code-line read, full-field encoding and endorsing.

The basic S1800 model has the same features as the S1700 with the addition of an automatic document feed module, programmatic pocket selection and a sort speed of 120 document/min.

The basic S1900 has all of the features of the S1800 and can automatically fine-sort documents at up to 240 document/min.

A series of Burroughs standard application program products is available for use on each of the models in the S1000 series. Complementing the program products is a programming language called Encoder Programming Language (EPL).

EPL gives the user an opportunity to utilize a higher level language, eliminating costly program development and allowing the user to implement changes in S1000 programs without recompiling, according to the spokesman.

First deliveries of the S1700, S1800 and S1900 are scheduled for the second quarter of 1977. Purchase prices for typical configurations range from $45,400 or $1,265/mo to $64,036 or $1,750/mo.

As a Security Safeguard

Off-Site Storage Can Prevent Data Disasters

By Laurence E. Tobin
Special to Computerworld

- *A regional Internal Revenue Service (IRS) installation near a major airport lost the contents of a number of reels of computer tape containing thousands of tax returns. The tapes were erased by the action of the airport's radar. It turned out that the metal shielding in the tape storage facility had been inadequately grounded.*
- *In December 1971, when the Arizona State Finance Center in Phoenix discovered one of its tape files had disappeared, it tried to reconstruct the file from punch cards. To its dismay, it learned 2,000 of the DP cards had just been destroyed — folded, gilded and used as Christmas decorations.*

These are not isolated examples. They are occurring today with increasing frequency as information storage becomes more centralized. To all executives, not just DP managers, they are horror stories.

There is good cause for horror. Reconstructing files can be extraordinarily difficult and time-consuming or, in other words, expensive.

It's been estimated, for example, that it costs $25 to enter a name and related information on a credit card list. Since a tape may contain as many as 15,000 of these entries, the expense of putting Humpty Dumpty together again may reach $375,000.

Casualties like the IRS disaster and the gilded punch cards are pushing jittery management at large and small companies alike into audits of their DP security systems. The focus is on data, not hardware.

Many firms also are opting to keep a set of duplicate tapes and microfilm master negatives at off-site locations. An extra goad spurring the use of these off-site locations is the increasing federal requirements for corporate retention of records. It's becoming impractical to retain all that data in-house for years on end.

Establishment and perpetuation of an effective information security system is a new and unfamiliar responsibility for corporate management. But — as the above cases illustrate — the most valuable assets of many companies aren't plant and equipment or even inventories of raw material or finished goods.

It's their collection of magnetic tapes and microfilm negatives used by their DP facilities. They contain the data base and transaction information that are the lifeblood of the organization. They assure that business functions effectively and efficiently in a competitive environment.

Companies are seeking outside assistance and support services to help discharge management's responsibility for data security. Such a service should be designed to safeguard DP magnetic media and computer output microfilm negatives.

An integrated system for providing information security and creating a unique system security audit should also be included in the facility.

Monitored Atmosphere

The building's atmosphere should be monitored to maintain temperature and humidity standards that have been set by the American National Standards Institute (Ansi) to prevent damage to tape and film surfaces. Electrostatic air filtration should ensure a dust-free environment. And the structure must be free from the magnetic fields that wreaked havoc with the IRS tapes.

Confidentiality should also be a byword. The company should not reveal the names of firms retaining records in the building, because users do not want it known where their vital corporate records are located.

The emphasis should not be on dead storage. Unlike a commercial warehouse or bank, the facility should offer access to stored tapes, microfilm and disks on a daily basis, even on an hourly basis.

Effective Off-Site Installation

The location of current copies of data files at a specifically designated, specially designed off-site installation has proven to be the most efficient and cost-effective approach to assured protection. This file relocation removes critically necessary information from exposure to physical attack against the DP facility and places it beyond possible compromise.

The ideal site is one far enough from a company's DP center to avoid simultaneous exposure to disaster or civil disorder, yet close enough to allow prompt recovery within an hour or two.

Corporate management's use of off-site security facilities is an important element in a company's information asset protection plan.

Tobin is director of Information Security Services at Bonded Services, a New York-based data security facility.

System Saves Pennsylvania Auditors Time, Money

HARRISBURG, Pa. — The Department of Auditor General here has implemented a large-scale system to save time, money and manpower in the preparation of more than 16,000 fiscal audit examinations annually.

Use of the DP system is permitting auditors to reduce the time and cost of auditing while, at the same time, allowing expanded coverage of the audit assignments, according to Auditor General Robert P. Casey.

The system "will bring the utmost efficiency to the department's work and make more complete examinations practical," Casey said.

He pointed out Pennsylvania is currently "unique and foremost" among states using computers for auditing, adding he expects the system, based on a Univac 90/30 computer, will become a model for other state governments in utilizing DP for auditing.

By its charter, the Department of the Auditor General is responsible for the auditing of the financial affairs of any entity funded or financially aided by the commonwealth, including departments, boards, commissions, agencies, instrumentalities, authorities and institutions.

Most state agencies are audited annually. Additionally, numerous special audits are conducted on request of the governor, public officials and citizen groups. The department has about 700 employees, of whom approximately 560 are actually engaged in auditing.

Another significant example of the computer's use is the testing of commonwealth expenditures, according to Casey. Approximately 2.8 million expenditures were processed by state agencies this past year, a figure he indicated probably will continue to increase in the years ahead.

Testing Saved Time

"The testing of expenditures for the audit of the Department of Health alone saved 25 man-days," Casey said. Use of the computer also permits the auditing of other commonwealth agency DP installations to verify their transactions are complete and accurate.

"Since most state agencies process their expenditures by computer, it naturally makes good sense to audit the computer programs and DP equipment that produce the results," he remarked.

The management information systems (MIS) group in the department is responsible for auditing and evaluating commonwealth agency information systems and DP operations to ensure that they are properly and accurately performed, that each agency complies with commonwealth regulations in acquiring and using computer equipment and that they are achieving results through efficient and economical operations, Casey explained.

In one instance, DP auditors found one agency's manual accounting records reconciled while its computer records were more than $2 million out of balance. This was caused by a programming error and might never have been revealed if the computer programs and files had not been audited, he noted.

In terms of dollars, the department reviews the expenditures of more than $6 billion disbursed by state agencies and outside entities receiving state aid.

Encumbrances Unencumbered

The use of computers and special computer audit programs has drastically reduced the time and manpower needed for just gathering the basic information to perform the audits, according to Casey.

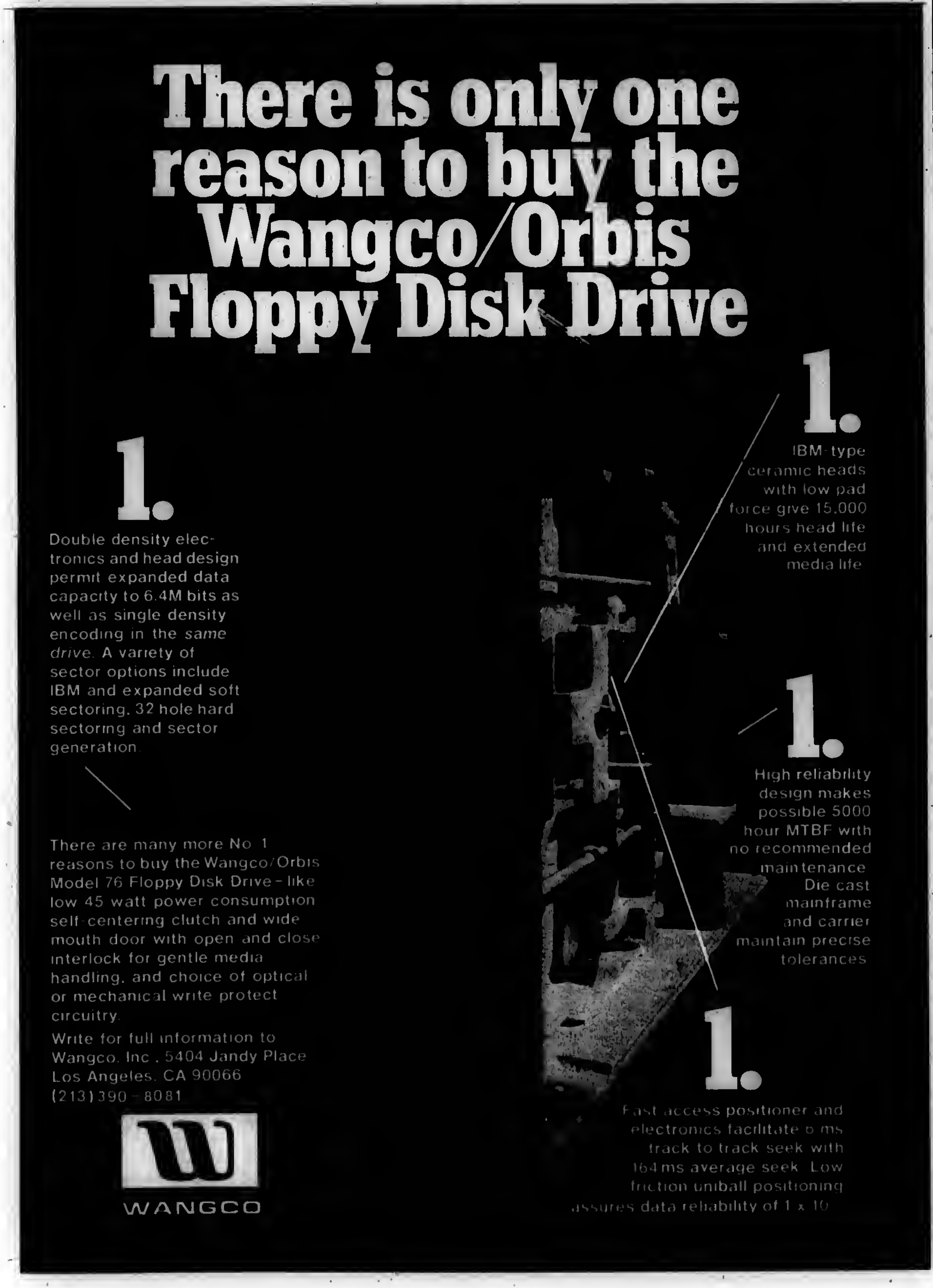
As an example, Casey cited the encumbrance audit which is conducted at the end of each fiscal year and involves the review of approximately 55,000 records. Encumbrances are commitments of current fiscal monies for specific purchases, contracts or services to be expanded during the next fiscal year.

At the end of the fiscal year, all unencumbered monies must be lapsed, that is, the unspent monies are returned to the commonwealth's surplus fund. The auditors must determine the validity of the encumbrances for all commonwealth departments, boards and commissions to make certain all committed funds are proper and all uncommited funds are returned to the commonwealth surplus fund.

"It used to take us at least six weeks and about 45 auditors to collect the data we needed to conduct our annual encumbrance audit. Now we process magnetic tapes containing each agency's encumbrance data and this has saved us 142 audit man-days," Casey said.

From the tapes, the auditors select those encumbrances to be checked, using established criteria, Casey explained. By printing this information for the auditors, he added, an enormous amount of clerical work normally required is eliminated, allowing the auditors to concentrate on more serious audit tasks.

Computer performance evaluations have proved to be very valuable to the organizations audited, he noted. In one case, a state computer installation was shown how to reduce its equipment expenditures by $87,000 a year.



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Construction Management System Cuts Utility's Costs

By Richard W. Page
Special to Computerworld

A customer of the New York State Electric and Gas Corp. (NYSEG) calls the company's local service office:

"What are you doing about my request to provide electricity to the new home I'm building?"

The service representative turns to a computer terminal, enters the customer's name and town and obtains a display of the number assigned to the service request. He then keys in the number, and the display screen provides a full project status report.

The service representative can tell the customer all the necessary preparatory steps have been taken and the work is scheduled for Thursday, three days hence.

The time-saving directness of obtaining needed information and the customer's appreciation of getting it so quickly are but two positive results of the first stage of a highly valuable project at NYSEG — a long-term program to automate our construction management operations.

Using an IBM 370/158, the program's objective is to streamline and cut the costs of processing and reporting construction projects by lightening the paperwork burden, eliminating time-consuming manual tasks and quickly retrieving and reporting accurate information.

NYSEG followed with interest what other utility companies were doing to develop and implement computer-based systems for estimating construction costs, scheduling resources and controlling inventory.

A special study team noted our generating facility projects were always contracted and, while expenditures were high, only one or two projects were under way at any one time.

A pilot project was initiated for construction of overhead distribution facilities in one operating district. The underlying goal was to develop an on-line computer system utilizing remote CRT terminals and printers and centralized random-access files.

On the strength of six months of successful pilot operation, NYSEG management approved a proposal to develop and implement a statewide automated construction management system (CMS).

It would embrace both electric and gas facilities and include transmission and substation as well as distribution projects. A common data base would be used by all 16 operating districts.

To operate the system, we selected the IBM 370/158 located at our Ithaca headquarters. It runs under OS/VS2 and utilizes IMS/VS for the data base/data communication requirements.

We also utilize IBM's 3270 data communication system — 3277 CRTs and 3286 printers — for remote communications.

Development of the entire CMS program prior to implementing any part of it would have resulted in an extremely long development period without payback. Therefore, we decided to divide the program into several phases.

Phase 1 addressed the same general functions as the pilot system — plus provisions for handling underground and gas projects as well as automated posting and inventory control of all transformers.

The fact we chose to concentrate first on the distribution project workload is what makes NYSEG's construction management system different from most comparable efforts in the industry.

The CMS Phase 1 system handles operations of four departments within each of 16 district offices — engineering, construction, stores and continuing property records (CPR). Each department is equipped with CRT terminals and printers.

A field engineer visits a location, determines what's to be done and, using a predefined coding system, writes the job specifications on a field report form.

Back at headquarters, an engineering clerk takes the specifications to the department's terminal and enters them. The terminal edits the entries, checks that company standards are being followed and displays any errors detected.

After correcting any keying errors, the clerk requests a job analysis. The computer generates and prints this document which describes the work to be done.

The analysis, error report and field form are reviewed by the planner to assure the job has been defined properly. Then the clerk obtains a job estimate from the computer which is used to determine the management level at which the project must be approved.

When the system is told the job has been approved, it assigns a work order number according to the size of the job. Job papers are then forwarded to the construction department where a construction clerk enters the crew assignment and starting date.

To obtain material for the job, the construction clerk requests the system to generate and print requisitions for the required materials and selected options such as material type either by a portion or all of the job.

The computer again reviews the specifications and splits the desired materials out into the defined requisitions.

When the job is completed, surplus material is returned to the storeroom. The storekeeper inputs a record of this return, and the system prints out a salvage requisition showing the job credited accordingly. Salvaged material on a maintenance work order is similarly recorded.

Job Balanced

After all salvage requisitions have been issued, the system is called on to print out a balance sheet. This document compares items and quantities as specified by the planner with quantities issued and indicates whether the job is balanced within prescribed tolerances.

If it is not balanced, it cannot be sent to the CPR department until the cause of the imbalance is determined and corrected.

The balanced job is routed to the CPR department. A CPR clerk audits the paperwork for completeness and accuracy and then requests a computer "summary of units" report.

In addition, CPR obtains a computer printout that shows the entries to be made to the district's continuing property records. These printouts are organized by line and pole and show all units of property installed, including feet of conductor. (This operation will be automated in Phase 3.)

To meet information requirements of the state Public Service Commission, the CMS system also maintains a file giving the location and characteristics of the 260,000 distribution transformers owned by the company.

Page is manager of computer services at NYSEG.

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HIS Adds Remote Upkeep For Series 60 Level 62

WALTHAM, Mass. – Honeywell Information Systems, Inc. (HIS) is providing its Series 60 Level 62 small-system users with Remote Maintenance Systems/62 (RMS/62) for remote diagnosis of problems.

With the system, which will be installed at most sites by year-end, engineers at the user's site will be able to get backup from other specialists, according to a spokesman.

Software problems can be analyzed and patches applied without the need for an emergency visit, the spokesman explained.

Users will need a telephone and Data Access Arrangement. Communications line charges will be paid by HIS, he stated.

The RMS/62 includes a remote console interface adapter which duplicates the functions of the operator console and a software diagnostic package.

HIS is at 200 Smith St., Waltham, Mass. 02154.

AEL Links Recorder, PDP-11

LANSDALE, Pa. – American Electronic Laboratories, Inc. (AEL) has designed the Model PTR/PDP-11 interface module to provide a link between AEL's pulse and transient recorder and Digital Equipment Corp.'s PDP-11 minicomputers.

The unit plugs into the small peripheral controller slot of the minicomputer.

The PTR/PDP-11 costs $1,075 from AEL at P.O. Box 552, Lansdale, Pa. 19446.

MDB Has LSI-11 Backplane

ORANGE, Calif. – MDB Systems, Inc. has a double-capacity backplane assembly housing eight quad or 16 dual modules for the Digital Equipment Corp. LSI-11.

Also available is an expander chassis with cooling, front panel and optional power supply, the firm said.

The backplane/cardguide assembly is priced at $295; the expander chassis costs $350. MDB is at 1995 N. Batavia St., Orange, Calif. 92665.

Power Supply Offered for Floppies

SANTA ANA, Calif. – Standard Power, Inc. has a line of multiple output, regulated dc power supplies designed for use in floppy disk, magnetic tape and cartridge tape systems.

Open frame construction allows convection cooling, the company noted. The power supplies cost about $109 from Standard Power at 1400 S. Village Way, Santa Ana, Calif. 92705.

First User of DEC System

Galaxy/5 Helps Service Keep Clients

By Esther Surden
Of the CW Staff

CHAMBERSBURG, Pa. – The first user of a Digital Systems Corp. (DSC) Galaxy/5 system said the on-line minicomputer is helping his service bureau offer real-time capabilities at lower cost to its users.

Computer Assistance, Inc., which has been in business for six years, was beginning to feel the squeeze of small users going to their own small business systems, according to Bill Kelly, vice-president in charge of operations.

"As our customers began to grow, they started looking at their own in-house systems. With this system we now can offer them almost an in-house system of their own, without any worries about programming and analysis," at a cost-effective price, he said.

The firm began to look around for a system to augment the IBM 3/10 it uses for batch operations.

Systems from Burroughs and IBM were considered as well as the Galaxy.

"We looked at other systems that would let us do the same thing but the price wouldn't let us offer the service to our customers at a price we felt was reasonable," he said.

The firm settled on the Galaxy/5 system based on its confidence in the manufacturer and its projected ability to perform in a cost-efficient manner, Kelly noted.

The Galaxy/5 configuration includes 64K of memory, two 65M-byte disk drives, one 200 line/min printer in-house and two more remote, and about six CRTs located in users' offices, he said.

The 3/10 has 16K of memory with 10K of disk, a 200 line/min printer and a card unit, he said.

Currently the 3/10 is running "about 60% payroll and the rest odds and ends," while the Galaxy is handling a few on-line applications. The Galaxy system is partially up with four customers on-line, but will not be fully operational until the end of the year, he noted.

Applications currently running on the Galaxy range from a complete grading system for a local high school to accounts receivable for local manufacturers.

The bureau has about 60 customers, Kelly added.

'Working Fine'

"The Galaxy has been working fine. The response times are almost unbelievable on some of the operations, comparing those with the IBM/3 which I'm most familiar with," Kelly said.

"In the assembly programs and some of the sort operations, there is quite a significant difference in time. Although we've only had up to five people using the system at one time, there has been no degradation of response.

"I don't know what it [the response time] will be once we get 15 or 20 CRTs on-line, however," he said.

The system cost about $92,000 excluding the software.

Service for the Galaxy is handled by DSC from its Frederick, Md., office, he noted. The bureau expects to keep pluggable parts available for system failure and to be able to run self-diagnosis to keep maintenance costs down in the future, he said.

Users treat the system almost like timesharing. They enter data in their offices. The service bureau massages it and returns the necessary documents to the user, Kelly said.

Most users can be taught to use the CRT in a half hour, he said, because of a prompting package that leads them through the work.

DEC Extends Datasystem Line With Two Entry-Level Machines

MAYNARD, Mass. – Digital Equipment Corp. has introduced an entry-level small business series of systems in its Datasystem line.

Two models of the Datasystem 320 series were announced.

The 322, housed in a desk, uses a floppy disk media for program and data storage. The 324, housed in a cabinet, uses disk packs for its storage and program media, according to a spokesman.

Both models include a CRT and a medium-speed dot matrix output printer.

Software for the 320 series includes DEC's Business-Oriented Language (Dibol) which runs under the CTS-300 operating system. Programs developed for the 320 series can be run without modification on the Datasystem 350 series and without source modifications on the 500, the spokesman stated.

The 320 systems can be used in distributed nets through the use of communications interfaces, he added.

A typical 322 includes 32K bytes of memory expandable to 56K, 512K bytes of floppy disk, a VT52 CRT and an LA180 dot matrix printer.

The 322 can include a controller and eight drives for RK05 disk packs for a maximum additional storage of 19.2M bytes. The disks are housed in a separate cabinet, DEC said.

The 322 can also accept a second dual floppy disk drive for a total of 512K bytes of storage, it added.

The typical Datasystem 324 has 32K bytes of memory, 7.2M bytes of disk, a VT52 terminal and an LA180 printer. It can be expanded with another 24K bytes of memory, additional terminals, a second printer and additional floppy disk and disk storage, DEC said.

The typical 322 system costs $20,900 with software support while the 324 system costs $34,000. The systems will be available next spring.

B80 Software Priced Separately

CHERRY HILL, N.J. – The most important part of the Burroughs B80 announcement was "Burroughs' new policy of pricing operating system software separately from the hardware and of making such software nontransferable by the purchaser," according to Management Information Corp. (MIC).

"When a user with a purchased B80 wants to sell it to another user, he cannot sell the operating system with it. Instead, the buyer will have to negotiate a new license agreement with Burroughs," MIC said in a spotlight report on the system.

"While Burroughs doesn't see any problem with B80 resale, we advise you to read the contract carefully particularly with respect to any restrictions to your rights to resell the system.

"Can you sell the machine without the operating system? Would you be forced to trade it in for another Burroughs system?" MIC asked users.

The B80 marked a recognition by Burroughs of the need for a multiterminal transaction-oriented processing system that is attractively priced, MIC noted.

The system features "complete upward software compatibility with the . . . B1800 and the large '800' series computers. This is a key attribute that Burroughs management has insisted upon," the report continued.

The complete report is available from MIC at 140 Barclay Center, Cherry Hill, N.J. 08034.

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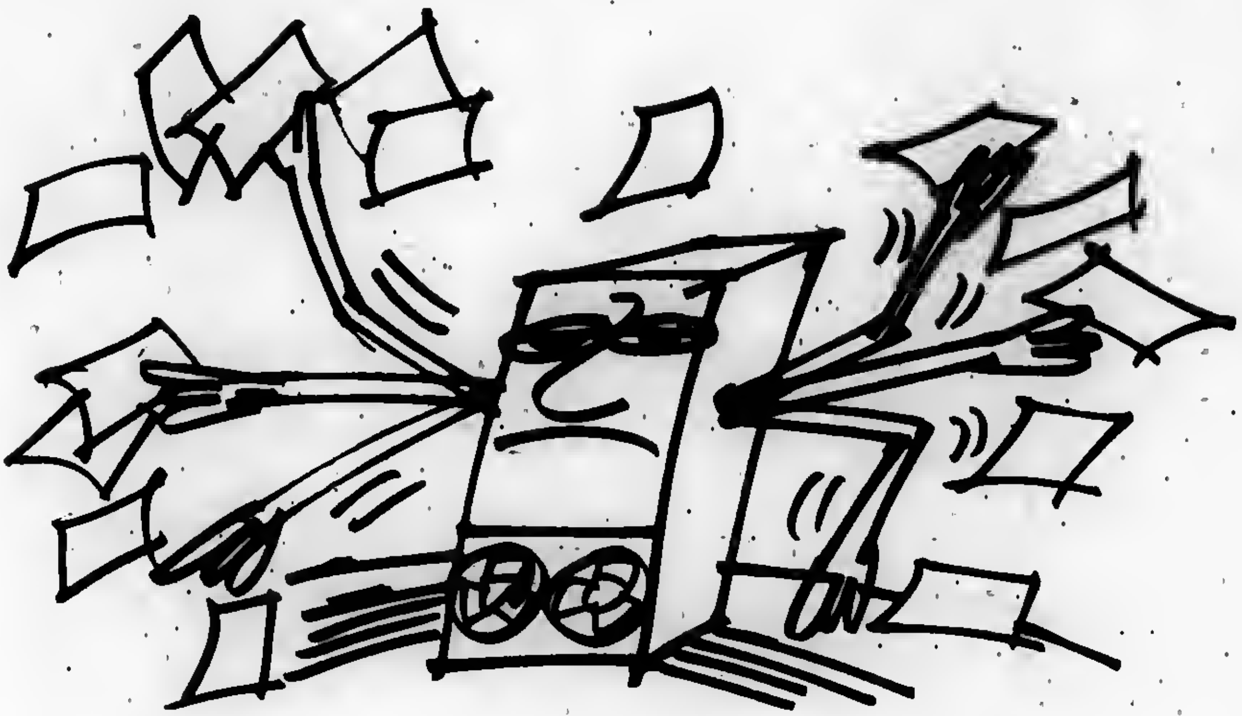

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Clothes Maker Ends Service Use, Goes In-House for Timely Data

LOS ANGELES — An in-house minicomputer at Peggy Lou Co., a manufacturer of women's sportswear here, has replaced a service bureau to provide "up-to-the-minute information," according to Bob Malouf, secretary-treasurer of the firm.

"When you use a service bureau there's a time lag; with our system, the interactive capability gives us information as current as the last transaction.

"By typing a request on the typewriter-like keyboard, the answer will be flashed on a CRT. Being able to 'talk' to our computer at any time gives our data a timeliness that just wasn't possible with a service bureau," Malouf said.

The Basic/Four Model 400 in use at Peggy Lou consists of a CPU; three CRTs, 8.4M bytes of on-line disk storage and a 300 line/min printer. It cost about $65,000 initially.

While the clothing manufacturer uses the small business computer for most of its standard office accounting functions such as order entry, accounts payable and general ledger, it finds the system pays off mainly in special applications tailored to the specific needs of the garment industry, Malouf said.

"We heve one computer program, for example, where we input exactly how many yards are available of a particular piece of material in a given shade. Then the system determines how many of each and what style can be made up and which styles go to which customer," he explained.

Advantage of Expandability

In addition to its interactive capability, another advantage of the small business system is expandability, Malouf said.

"At the present time, we're inputting data in order to develop a base for sales analysis by salesman, customer and style. We'll be able to track items by account, style, price and date sold.

"And once we've established the data base, we will be able to create a wide variety of meaningful comparisons and projections for the future," he said.

No one in the Peggy Lou office had a formal DP background, according to Malouf. "Although the one person who is in charge of inputting data into the computer attended a training program, none of our supervisors did — and they all use the CRTs for requesting information."

The system was chosen from five or six available from vendors including Burroughs, Singer and Qantel, Malouf said. "We went out to the vendors' local offices and visited some users in the area. Basic/Four had a lot of systems in the garment industry in northern California," he noted.

A deciding factor was the software supplier, he added. "We saw Basic/Four and SUM Co. at a local trade show," Malouf said. He added that the company is more than satisfied with the software from SUM.

The software has cost less than $20,000, he said.

As far as savings go, Malouf said the overall cost is less than a service bureau because the company is getting more from its own system than it did with the outside bureau.

"Although our accounting staff has remained the same in number, we are handling a great deal more data and generating a lot more reports and information than we did previously," he said.

Techtran Floppy Disk Can Operate On-Line

ROCHESTER, N.Y. — The Model 9512 Micro Disk floppy disk system from Techtran Industries, Inc. can be operated remotely to a CPU, the vendor said.

The system, which uses magnetic diskettes that hold more than 250K characters each, can be used off-line for data entry, high-density storage or file retrieval and update, according to a spokesman.

On-line, the system can perform as a communications terminal for data input, output and editing functions, he added.

High-speed random access of data files by location or character string are additional features, the company said.

RS-232C interfaces and dual connectors are included for use with terminals, minicomputers, modems and time-sharing systems at switch-selectable data rates from 110- to 9,600 bit/sec.

Track and sector address, character string search and selectable stop codes are also included, Techtran said.

The Model 9512 costs $2,595 from 580 Jefferson Road, Rochester, N.Y. 14623.

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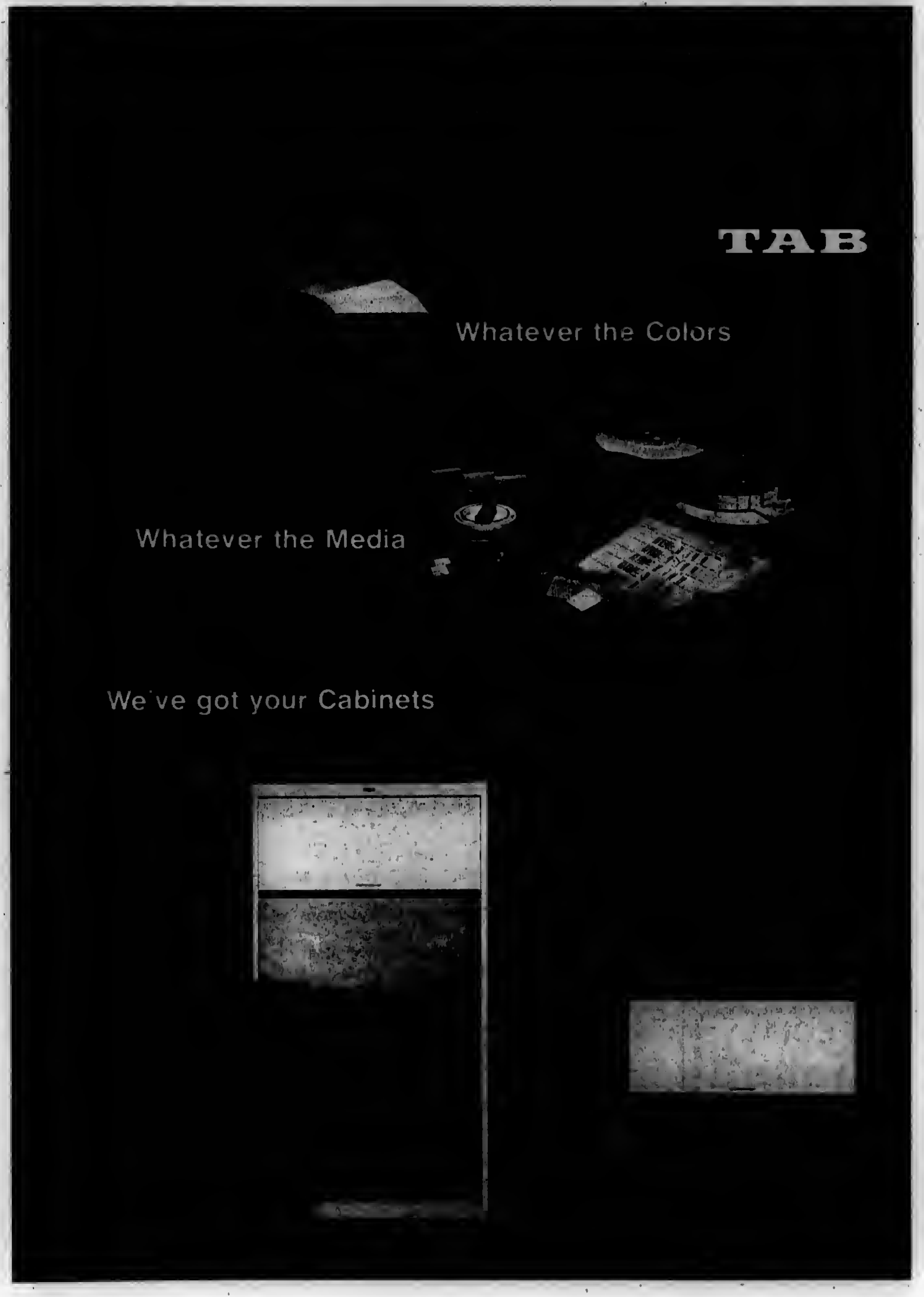

At Core of 70-Story Network

Three Minis Helping to Manage World's Tallest Hotel

By John P. Hebert
Of the CW Staff

ATLANTA — The management of the world's tallest hotel turned to a minicomputer-based system to support its dispersed offices and work areas.

The physical structure of the Peachtree Plaza Hotel here demanded a more sophisticated management tool than conventional means could offer, according to Lawrence A. Dustin, executive assistant manager of the 70-story, 1,100-room building.

Because of the hotel's design, Western International Hotels' management realized it needed good avenues of communication between the administrative work centers, shops and restaurants spread out over the hotel lobby's five floors to ensure smooth operation, Dustin said.

Management also felt it had a responsibility to Peachtree Plaza's architect/owner/developer, John Portman & Associates, to recommend and utilize systems which would be more profitable than any manual system could have been, he recalled.

Two 256K IBM 3/15 CPUs carry the processing load for guest accounting functions, accumulation and tracking of guest charges and for actual registration and checkout, Terry Hughes, DP manager, noted.

Another mainframe, a 52K IBM 7 connected to the 3/15s, serves as an information base for all of the Touch-Tone-type telephones in the hotel, Hughes said. On this CPU, data on guest telephone charges is captured, formatted and then transmitted to the primary 3/15.

A network of 25 IBM 3277 CRTs and six IBM 3286 printer terminals are located primarily in the registration/checkout area, but also can be found in the restaurants and other in-house retail sites operated by hotel management, according to Hughes.

Phone charges are received from Southern Bell Telephone Co. and put directly into the IBM 7. This information, Hughes said, is used to update the data on the 3/15.

A second function of the IBM 7 is to satisfy the needs of a large housekeeping department.

This system lets management know if the guest rooms have been cleaned and whether guests have packed up and left.

In addition, guests' wake-up calls are keyed into the primary 3/15 and, at 2:30 a.m., the requests are run through a software program and calculated in reverse order to determine the order of calls in the morning.

This information is then transferred from the 3/15 to the 7 system and executed at the appropriate time through an IBM communications line arrangement, Hughes said.

The wake-up calls are computer-controlled: a taped message lets the guest know the time and the outside air temperature and suggests trying one of the hotel's restaurants for breakfast.

The system has a 40-call capability each minute, he added.

The primary 3/15 is also used to document hotel employee entry and exit times. The data, Hughes said, is used to authorize all employees for particular job-related areas within the hotel.

The second 3/15 is predominantly a batch machine which serves as backup to the primary, Hughes said, adding it can be switched to perform the duties of the primary CPU in five minutes.

The secondary 3/15 is used for payroll, general ledger and general administrative functions in the hotel, according to Dustin.

The system includes two IBM 3340 disk drives for each 3/15, amounting to 100M bytes of storage, and two tape drives, one from IBM and the other from Pertec Computer Corp., which are used as part of an interface to the United Airlines computer center and central reservation system in Denver; an Incoterm CRT terminal feeds the information to the reservations net.

Western International management initially looked at different computer equipment vendors before turning to IBM.

It chose IBM, he said, because of reliability, high caliber of personnel, accessibility to IBM's General Systems Division, which is headquartered here in Atlanta, and because it could answer the question of "where the vendor would be in a few years."

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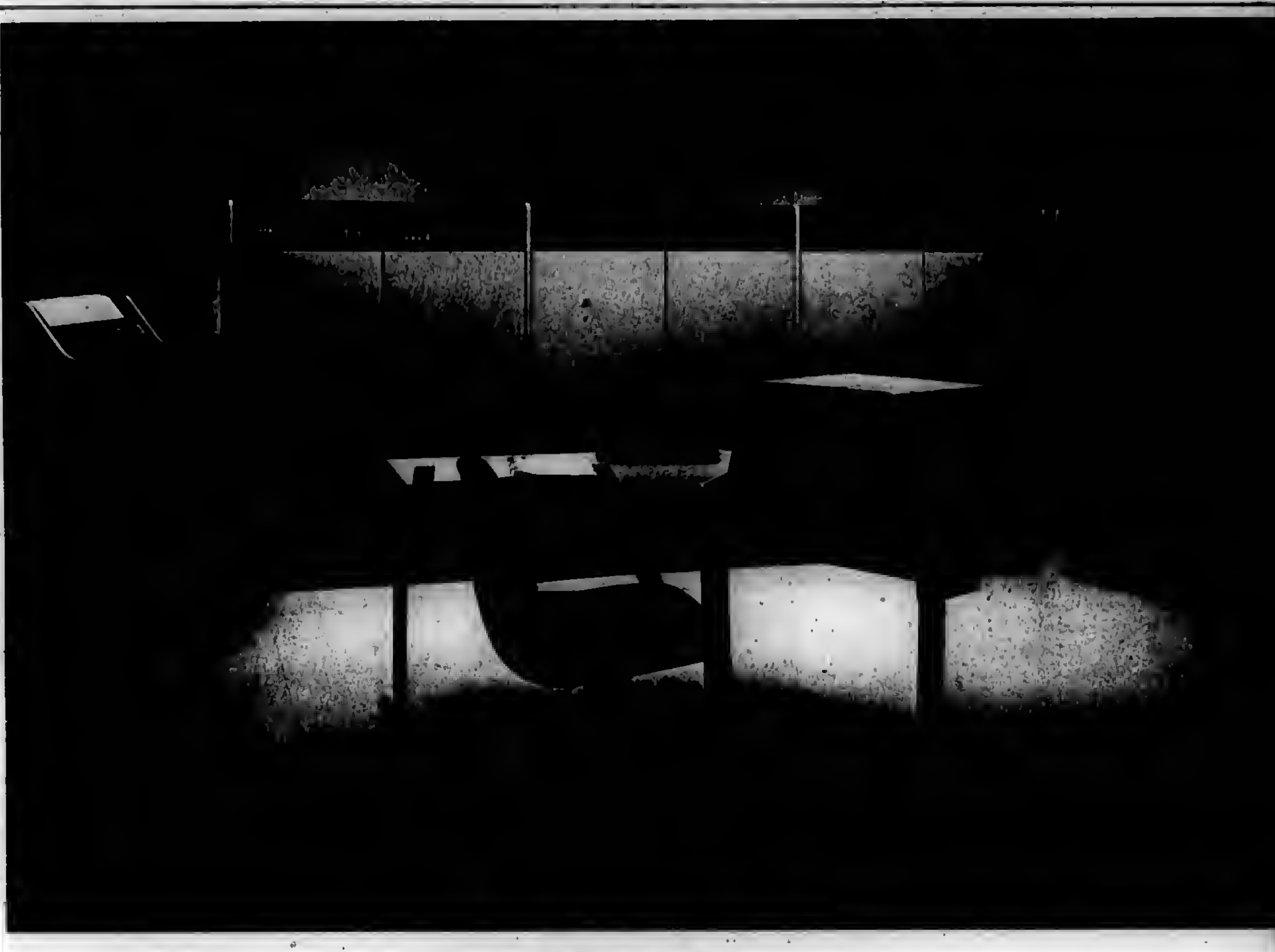

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Calculators Take Manufacturer's DP to Sales Level

SAN MARCQS, Texas — A manufacturer of large-scale lighting fixtures here has extended DP to the sales level with computing and programmable calculators.

The firm, which uses an IBM 3 batch mini for its accounting functions and is presently using time-sharing for its engineering DP needs, is providing its sales force with programs for its Hewlett-Packard (HP) 65 programmable calculators, according to C.J. Eagan, director of application engineering.

Widelite Corp. has manufacturing and sales operations in Europe, Australia, Canada and Mexico and currently is using about 70 of the $795 programmable calculators.

Each sales representative gets a binder with 125 magnetic preprogrammed cards for calculations involved in lighting design.

"We were looking for something we could give the representatives for quick calculations, and the HP 65 had just come out. Several of the reps expressed interest in buying the calculators if we would provide the programs," Eagan recalled.

The engineering department expects to extend its DP capability shortly with the installation of a Prime 400 minicomputer to replace the time-sharing, he added.

The "field" HP-65s have played an important role in the success of one of Widelite's major products.

Automatic energy control (AEC) uses a photocell to control the brightness of lighting systems.

As lights age and gather dust, they gradually lose intensity. The traditional solution has been to set a minimum level and purchase lights with an intensity far above it; then, as the lights lose their brightness and approach the minimum level, they are replaced.

Using Widelite AEC, the photocell continuously monitors the lighting level, dimming and brightening the lights to retain the optimum level. When the lights can no longer be brightened to the proper intensity, an indicator light on the AEC panel notifies the operator of the need for a change.

Using AEC can be very efficient, Eagan said. For example, a manufacturing plant with 500 luminaires of 1,000-watt sodium burning 24 hours per day in dirty conditions can save up to $20,000 each year with AEC reducing energy consumption by over one million kilowatt-hours.

The HP 65 allows Widelite representatives on-site to take variables on wattage, type of lamp, dirtiness of environment and annual hours of use to give savings of equipment and energy and to design the most efficient lighting configuration, Eagan said.

Resourcefulness in Use

Some sales offices have three or four HP 65s. Many of the sales representatives have shown considerable resourcefulness in their use of the calculators, Eagan said.

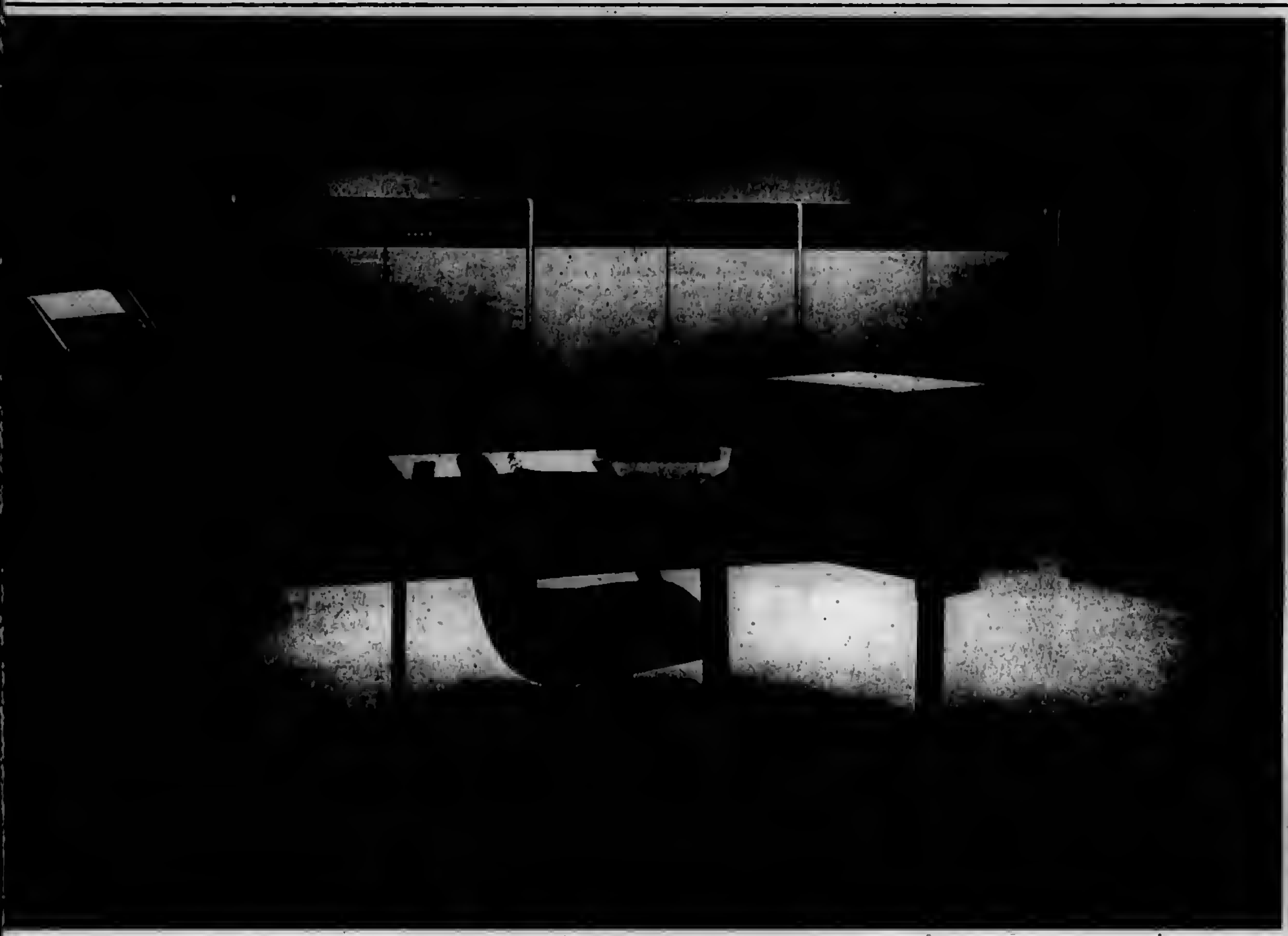
"We feel the combination of computers and calculators gives us the capability to use the efficient amount of DP power on any given problem. Mathematical operations that are not overly complex but require quick answers can be handled in the field by the HP 65s," Eagan said.

"Large problems of design and implementation needing extensive manipulation and a less restrictive time limit can be accomplished by the batch computers.

"We can't begin to estimate how much money and time the calculators have saved this company," he added, pointing to one salesman.

"The ability of the HP 65 to yield quick and accurate data saved one of his sales and landed another. He saved the sale by convincing an engineer with on-the-spot facts that he should stick to original specifications.

"He landed the other sale by being able to give the correct data to a designer who needed it right away."



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Milgo Plans to Sell Common To UK's Racal Electronics

MIAMI — Milgo Electronic Corp. has reached an agreement to sell 312,000 shares of its common stock to Racal Electronics Ltd., a British communications equipment manufacturer.

Milgo will receive $6.7 million from the sale of stock and will use the proceeds to reduce bank borrowings, according to Monroe A. Miller, Milgo president.

The agreement is totally unrelated to two recent acquisition offers from Applied Digital Data Systems [CW, Nov.22], he added.

Milgo reported earnings of $2.4 million or $1.35 a share on revenues of $41 million for the year ended Sept. 30 compared with earnings of $4.2 million or $2.50 a share on revenues of $40 million a year ago.

Lear Siegler Plans Terminal

SANTA MONICA, Calif. — Lear Siegler, Inc.'s Data Products Group plans to have an intelligent terminal with arithmetic capability next year, according to group manager Lee Falco.

The unit will also feature user programmability beyond that found in the firm's semiintelligent ADM-2, he said.

Supershorts

NCR Corp. and the USSR have signed five-year agreements aimed at the application of electronic retail systems in Soviet department stores, supermarkets and restaurants.

— — —

Shugart Associates has signed a two-year OEM agreement with Computer Automation to supply that firm with SA800 floppy disk drives. The floppies will be used in minicomputer software development systems and automated digital logic module testers.

— — —

Data 100 Ltd. has appointed Ashworth Automation Ltd. as its Canadian distributor of magnetic disk drives, horizontal-belt line printers and core memory modules.

— — —

The National Association of Independent Computer Companies (Naicc) has been formed for independent computer OEMs and distributors. Information is available from P.O. Box 75095, Cincinnati, Ohio 45272.

Because of Amdahl, Itel Inroads

Study Expects IBM Anti-PCM Strategies

By Toni Wiseman
Of the CW Staff

MENLO PARK, Calif. — With the recent announcement of Itel's Advanced Systems and the inroads being made by Amdahl Corp., IBM is likely to implement some strategies to counter the plug-compatible manufacturers' (PCM) mainframe threat, according to Input.

A recent study by Input examined the possible IBM strategies, specifically with regard to Amdahl, and Amdahl counterstrategies.

In the short term, the major step IBM has taken is the announced 370/158 upgrade, designed to fill the hole in that line's price/performance, according to Input.

The study did not see IBM bringing out "fighting machines." At this high end of the spectrum, such a venture would be very expensive and, based on IBM's less than spectacular past history of fighting machines (the 360/22, 44 and 67), does not appear to be a good idea, the report indicated.

Beyond the 370/168-3, the study also did not foresee any substantial increases in IBM's price/performance in the short-term — the next 18 months — based on the difficulty of getting the hardware ready.

30% Price Cuts Possible

Rather than improving performance, IBM would be more likely to cut the system price, for instance by lowering the cost of memory, to combat the PCM threat, the report said.

If IBM were to both cut memory price and integrate channels into the CPU, it could cut system prices to the user by 30%, Input estimated.

But if IBM takes this course, it will also impact its own revenue base; the question arises as to how much erosion IBM is willing to tolerate, the study noted.

Input suggested the giant will probably allow Amdahl to get 20%, the PCM penetration it has traditionally tolerated.

In terms of systems threatened by Amdahl's 470V/6, IBM had 2,225 such systems installed in the U.S. and 1,272 abroad at the end of 1975.

If Amdahl were to reach the 20% penetration mark of the current installed base, its base would represent 445 systems in the U.S. and 254 systems internationally, according to Input.

Looking toward 1980, Input predicted IBM would have 3,840 systems in the U.S. and 3,521 abroad. A 20% penetration would mean 768 U.S. systems and 700 abroad for Amdahl.

The 20% figure is, however, probably a high estimate, according to Michael P. Burwen, Input's director of marketing. But even figuring medium penetration, Amdahl could count on an installed base of 380 systems or 185 with low penetration, he said.

Thus, in the short term, IBM's only counterstrategies would be to lower memory prices, integrate data channels and increase the size of high-speed buffers, according to Input.

More Time, More Options

Over the next 12 to 24 months, however, the picture will change drastically, offering IBM several options.

These include modification of 158/168 architecture by converting the mainframe into a series of multifunctional processors and utilizing relocatable control storage to put OS kernels into long-range function to decrease system overhead, the report stated.

IBM could also utilize new memory technology (such as bubble, or charge-coupled devices) to lower prices, unbundle prices of hardware operating systems, put OS software into hardware and take advantage of new component technology to decrease the number of components in the package, Input noted.

What can Amdahl do? The biggest step Amdahl can take to maintain its revenue base is to go into the peripherals business, the report suggested.

This would be easily possible through Amdahl's tie-in with Fujitsu, it added.

Amdahl's strategy should therefore be to influence customers to use plug-compatible peripherals either from other third parties in the short term or from Amdahl itself in the long term in order to lessen users' dependence on IBM.

Breakeven Point

Amdahl's viability in the long run does not seem to be in jeopardy, Burwen said. The firm's breakeven point is one machine per month and it is currently turning out four monthly.

The problem is in sufficient test equipment to get the computers out to the users, he said. Amdahl currently has a backlog of several months' orders and "there doesn't seem to be any end to it in the short term," Burwen said.

In addition, Amdahl has Fujitsu's money behind it.

And, as a final point in its favor, Amdahl has sold numerous machines to AT&T which will therefore probably be as supportive as possible to see that Amdahl survives in the long term, he added.

The report, entitled "Amdahl as a Viable Alternative to IBM," is available from Input at Suite 320, 2180 Sand Hill Road, Menlo Park, Calif. 94025.

IBM Restructured Equipment To Counter PCMs: Calcomp

By Molly Upton
Of the CW Staff

LOS ANGELES — Jurors in the trial of California Computer Products, Inc. (Calcomp) vs. IBM were presented with an encapsulated version of IBM actions to prevent further incursions by plug-compatible manufacturers (PCM) into its installed base.

During the action-packed years — 1970 through 1972 — IBM reworked its Model 2314 drives into a "kluge" that offered a 25% price reduction per spindle and incorporated some of the controller functions into the CPU and one of the drives, Calcomp attorney Max Blecher said in quoting an IBM memo in his opening argument.

First introduced for the 370/135 and 145, the same scheme was used to combat PCM activity in the 360 area; these models were known as the 2319A and B respectively, Blecher said.

The Fixed Term Plan, initiated in May 1971, offered users 8% and 16% reductions for one and two years respectively and also locked in customers, especially 3330 users, who might otherwise have been prospects for PCM gear, he said.

Although IBM initially lost revenues on the plan, as illustrated by internal documents, the scheme served to reduce PCM business and make it increasingly difficult for PCMs to procure financing, he said.

IBM later offered an Extended Term Plan

(Continued on Page 44)

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Wyly Holders Opt for Recapitalization Over Bankruptcy

DALLAS — When Wyly Corp. shareholders met for their annual meeting here recently, they were faced with a tough decision — whether to vote for or against a reorganization plan which Sam Wyly described as the only alternative to Wyly's total bankruptcy.

They opted for recapitalization and projected profitability in 1977.

"Our massive losses (aggregating approximately $135 million during the last two and one half years), principally from the fire and casualty insurance business and [the Data Transmission Co. (Datran)], have resulted in a crippling deficit net worth," Wyly said.

"The insurance business has been sold and Datran has declared bankruptcy, but Wyly Corp.'s financial condition and prospects are too precarious to survive without recapitalization," he asserted.

Wyly's "Plan of Recapitalization" calls for the exchange of approximately $39 million of subordinated 7-1/4% debentures for 25 shares of Wyly common and 20 shares of Wyly Series A convertible preferred stock for each $1,000 principal amount plus cancellation of accrued interest thereon.

Some $11 million of 4% capital notes will also be exchanged for 30 shares of common and 22 shares of Series A preferred under the same terms.

Additionally, outstanding Walter Haefner Holding AG securities, including investment in Wyly and Datran of approximately $55 million, of which at least $45 million is a senior secured claim, will be exchanged.

The exchange will entail Wyly common stock representing approximately an initial 47% of the Wyly common stock.

Finally, Wyly is calling for a reverse one-for-two common stock split, reducing the number of issues shared to 4,302,680.

Proxy Outlines Risks

According to a proxy statement, the board of directors of Wyly also concluded the recapitalization plan was the only realistic alternative available to Wyly.

If the plan cannot be consummated, Wyly will, in all probability, be forced into bankruptcy, the board of directors said.

They noted, however, that because the plan of recapitalization "is subject to numerous contingencies," even if it is approved by Wyly stockholders "there is no assurance the plan can ultimately be consummated."

The prospectus further noted that "if the plan of recapitalization is consummated, the securities of Wyly will continue to involve a high degree of risk. It is difficult to call attention to all of the possible risks involving Wyly or to indicate their relative Importance."

Allen & Co., Wyly's accountant, did list eight risk factors, ranging from the uncertainties concerning Wyly's ability to continue operations to management turnover.

It pointed out, for example, that Datran, in which Wyly Corp. has 86% ownership, has gone into bankruptcy, resulting in a loss of $53.2 million. Furthermore, "Wyly does not anticipate recovering any of its investment in Datran through the liquidation of Datran."

While the accountants indicated Wyly has no contractual liability for Datran's debts, they said certain creditors might attempt to assert such a claim and at least one has.

Another risk mentioned was "significant overhead costs." There is no assurance Wyly will be able to reduce these costs "to a level commensurate with its ongoing data processing operations.

"In addition, during the current year, Wyly has incurred and is continuing to incur substantial expenses in connection with the plan of recapitalization, and Wyly anticipates incurring substantial expenses with respect to its antitrust lawsuit against AT&T for a significant number of years."

Uncertainties relating to University Computing Co. (UCC) were also cited as a risk since, while UCC's foreign operations have been profitable, its domestic operations have been only "marginally" profitable.

"However, foreign operations are subject to the risks relating to fluctuations in foreign currencies and restrictions exist as to the repatriation of earnings derived from foreign operations," the accountants said.

"That portion of domestic operations represented by UCC's banking software has been unprofitable on an annual basis since 1973 and continued to be unprofitable for the six months ended June 30, 1976," the prospectus stated.

The prospectus further noted there is no assurance of dividends or sinking fund payments on the Series A preferred stock and, in the past 12 months, a number of management executives — including the chief financial, accounting and legal officers and UCC's chief executive officer — have resigned.

Final risk factors include UCC's extreme dependence on its staff of trained technical employees, the loss of which would have a "materially adverse" effect on UCC, and the fact that Wyly's DP business may be adversely affected by technological advances since "UCC's software is designed principally to operate on computers manufactured by IBM and a majority of its DP services are provided on computers which are not of the most technologically advanced design."

SDC Set to Market Ampex TBM Systems

SANTA MONICA, Calif. — Ampex Corp. and System Development Corp. (SDC) jointly announced an agreement in which SDC will have the exclusive right to market the Ampex TBM mass storage system worldwide.

Ampex will continue to market its TBM equipment to computer mainframe manufacturers on an OEM basis.

Under the agreement, SDC will purchase TBM data storage equipment from Ampex. SDC will then develop mass storage systems for its customers.

Earlier this year SDC named Ampex to provide a $1.8 million TBM system for use in the Tiros-N weather satellite program slated for introduction in 1978 by the National Oceanographic and Atmospheric Administration.

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IBM Restructured Devices as Anti-PCM Move: Calcomp

(Continued from Page 42)

which gave a 16% discount on a two-year plan and eliminated the use charge. Users could renew on a one-year basis.

Although the documents Blecher showed the jury during his opening statement are not yet admitted as evidence, they give some indication of what will be seen as the trial progresses.

An October 1968 presentation to IBM's management committee indicated "OEMs [were] here to stay, but their growth rate in the future [would] be controlled significantly by IBM's product strategy."

Calcomp contends these actions were designed to and did inhibit and virtually destroy the PCM group.

IBM acknowledged "competitive OEM products are characterized by superior performance, access time and lower rental/purchase than IBM," Blecher said.

In January 1970, a person was assigned to find a solution to the PCM problem since "they are killing us on 2311s," one document said.

An IBM listing of the number of accounts installed in April 1971 ranked Telex first followed by Memorex; Potter and Calcomp/Century.

Memorex had the lowest selling price and was obtaining the most new accounts, according to IBM documents.

IBM recognized PCMs were offering users annual savings compared with IBM prices of between 21% for a 360/30 to 26% for a 360/65. This amounted to $23,388 and $191,730 respectively.

Reuse of 2314

By March 1970, the management committee declared peripherals a "key corporate strategic issue" and assigned a task force to recommend actions on peripherals, which did not then include terminals.

The task force's solution was a "possible recommendation by reusing 2314 disk drives in a three-file kluge." The code name for this product, which became the 2319A, was "Mallard."

"Mallard is a three-drive 2313 with electronics added for native attachment to CPU models of the [360/135 and 145]," IBM said in a document.

In July, IBM assessed Memorex and Telex as viable. "They are viable, they will erode IBM's tape and file lease business . . ."

The head of IBM's San Jose laboratory, J.D.Kuehler, described Mallard as "not actually a new machine," although it would appear to be, Blecher said.

"The hardware contents of the file is to have design and reuse of parts dating back several years," Kuehler wrote in an August 1970 memo.

"The 2319 drives are not visually recognizable as they are bolted together with other drives of the series and visually bear no unique identity," Kuehler said.

The Mallard system eliminated the controller box — a high profit item for PCMs — by splitting the controller's functions between the CPU and the three-spindle disk drive, Blecher said.

The 2319A cut well below the PCM price, he added. The 2319A rented for $2,805/mo while the PCM gear cost $3,650/mo in comparison with the original IBM 2314 price of $4,559/mo.

Blecher contended a good part of the reduced revenues were recoupled through prices on the 135 and 145.

IBM did essentially the same thing with the 2319B for 360s in December 1970, Blecher said.

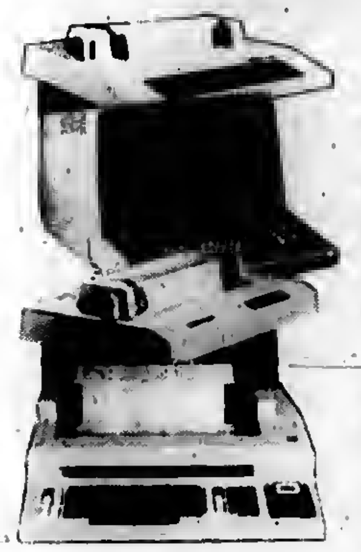
Within 30 days of IBM's December 1970 2319B announcement, Telex was nearly down to the IBM price and the others were expected to follow, IBM noticed.

Although in January T. Vincent Learson had opposed price hikes in CPUs and another executive had argued against long-term lease plans, IBM initiated its Fixed Term Plan by the end of May.

Less than a month later, it raised prices on CPUs. A memo written at that time indicated the net effect of the combined actions would probably be "a wash."

In April IBM calculated Memorex's profit margins and concluded a 17% cut in prices would cause Memorex to lose money, regardless of its market share.

The Fixed Term Plan, Blecher reminded the jury, represented a 16% price cut by IBM on two-year leases.



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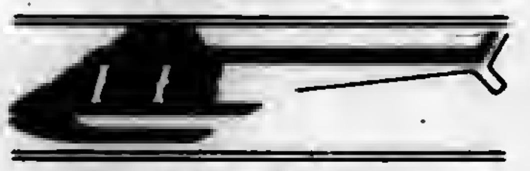

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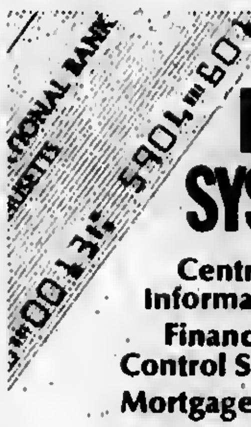

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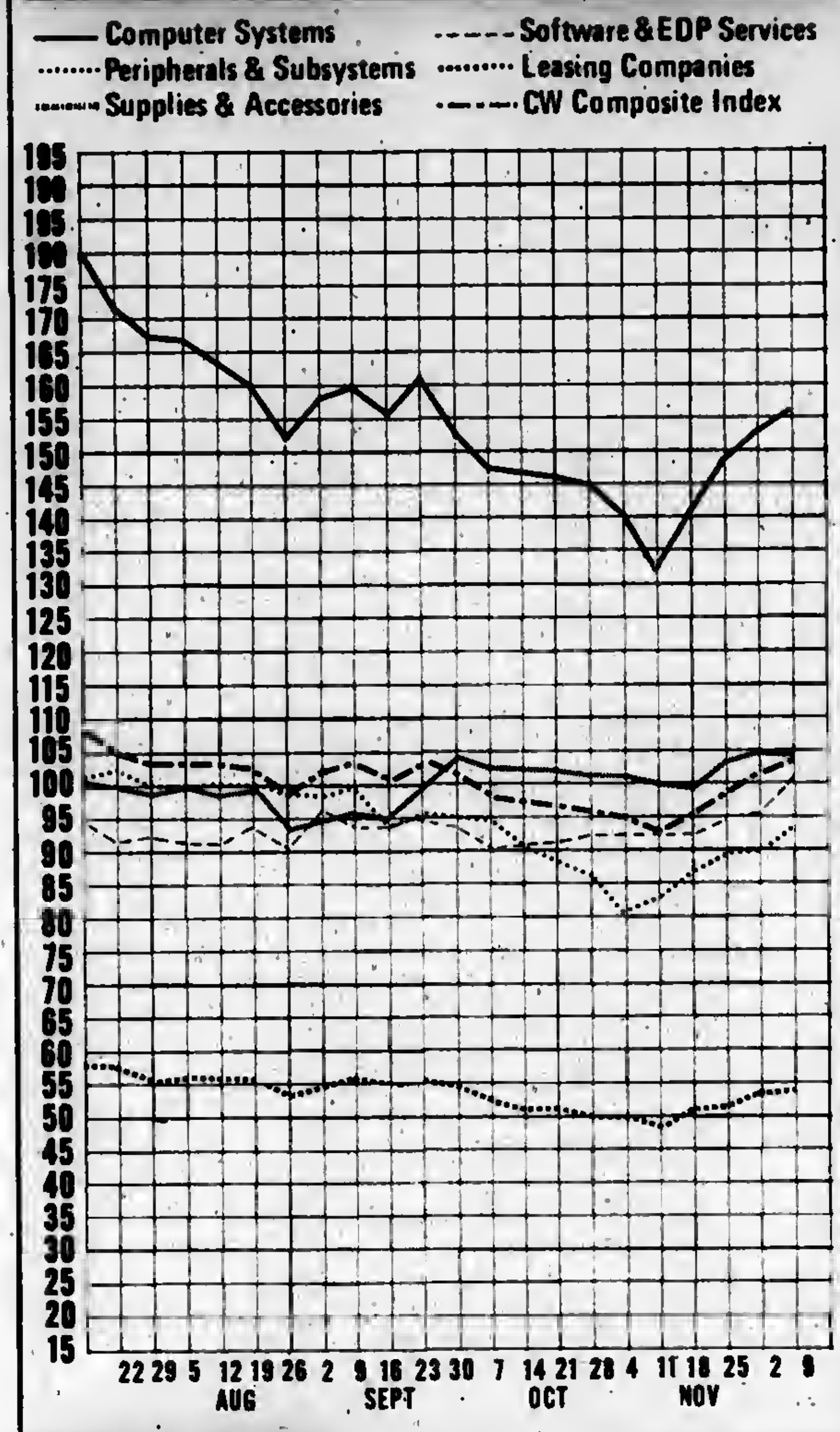

Earnings Reports

GENERAL SEMICONDUCTOR
Three Months Ended Aug. 31

	1976	1975
Shr Ernd	$.24	$.20
Revenue	1,334,493	1,029,288
Earnings	124,863	95,614
9 Mo Shr	.74	.59
Revenue	3,882,100	2,902,386
Earnings	366,150	e289,398

e-Includes $30,159 gain from sale of property.

GRAHAM MAGNETICS
Three Months Ended Sept. 30

	1976	1975
Shr Ernd	$.16	$.20
Revenue	3,984,483	3,728,361
Earnings	151,845	183,942

GRI
Four Months Ended Sept. 4

	1976	1975
Shr Ernd	.....	$.03
Revenue	$16,260,000	16,667,000
Earnings	(50,000)	87,000
9 Mo Shr	.....	.74
Revenue	43,405,000	49,301,000
Earnings	(107,000)	1,883,000

HARRIS
Three Months Ended Sept. 30

	1976	1975
Shr Ernd	$1.20	$.94
Revenue	126,770,000	118,860,000
Earnings	7,594,000	5,851,000

HAZELTINE
Three Months Ended Sept. 30

	1976	e1975
Shr Ernd	$.45	$.24
Revenue	21,705,000	22,663,000
Earnings	909,000	457,000
9 Mo Shr	2.90	.....
Revenue	66,477,000	61,022,000
Tax Cred	1,050,000	.....
Earnings	b5,814,000	(908,000)

e-Includes $94,000 from investment sale. b-Includes $2,660,000 from settlement of contract claims with U.S. Air Force.

LEAR SIEGLER
Three Months Ended Sept. 30

	1976 (000)	e1975 (000)
Shr Ernd	$.37	b.....
Revenue	171,474	$152,997
Earnings	6,081	3,954

e-Restated. b-Antidilutive.

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Computerworld Stock Trading Summary

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All statistics compiled, computed and formatted by
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EXCH		PRICE			
		1976 RANGE 111	CLOSE DEC 8 1RT6	WEEK NET CHNGE	WEEK PCT CHNCE
	COMPUTER SYSTEMS				
O	ANDAHL CORP	23- 33	33	+5	+17.8
N	BURROUGHS CORP	84-108	88 3/4	-1 5/8	-1.7
O	COMPUTER AUTOMATION	10- 19	17 1/2	+1 1/4	+T.6
N	CONTROL DATA CORP	18- 27	23 1/2	+ 5/8	+2.T
N	DATA GENERAL CORP	40- 60	42 7/8	-4 5/8	-9.7
O	DATAPOINT CORP	24- 46	31 1/2	+1	+3.2
O	DIGITAL COMP CONTROL	2- 7	6 1/8	+ 1/8	+2.0
N	DIGITAL EQUIPMENT	46- 60	54 1/8	-2 3/8	-4.2
N	ELECTRONIC ASSOC.	2- 5	2 1/8	0	0.0
A	ELECTRONIC ENGINEER.	7- 16	8	- 3/8	-4.4
O	FOUR-PHASE SYSTEMS	13- 21	16 5/8	+ 3/4	+4.7
N	FOXBORO	28- 50	50 1/8	+2 1/4	+4.6
O	GENERAL AUTOMATION	4- 11	6	+ 1/2	+9.0
O	CRI COMPUTER CORP	1- 1	1/2	0	0.0
N	HEWLETT-PACKARD CO	80-117	8T 7/8	-5 3/4	-6.1
N	HONEYWELL INC	34- 56	46 3/4	+2 1/4	+5.0
N	IBM	227-288	272 3/4	+ 3/4	+0.2
O	MANAGEMENT ASSIST	1- 8	8 3/8	+ 3/4	+9.8
O	MEMOREX	1T- 33	21 1/4	+ 1/8	+0.5
O	MICRODATA CORP	10- 28	16 7/8	+ 7/8	+5.4
O	MODULAR COMPUTER SYS	3- 14	5 1/8	+ 5/8	+13.8
N	NCR	24- 37	35 1/8	+ 1/8	+0.3
O	PRIME COMPUTER INC	4- 18	16 1/2	-1 1/4	-T.0
N	PERKIN-ELMER	18- 2T	20 7/8	+ 1/8	+0.6
N	RAYTHEON CO	45- 6T	61 3/4	+2 3/4	+4.6
N	SPERRY RAND	40- 52	43 3/4	- 3/4	-1.6
O	SYCOR INC	9- 31	13 1/2	+ 3/4	+5.8
A	SYSTEMS ENG. LABS	5- 10	6 1/8	- 1/8	-2.0
N	VARIAN ASSOCIATES	12- 17	14 1/8	+ 1/8	+0.8
A	WANG LABS.	11- 20	15 1/8	+ 3/8	+2.5
	LEASING COMPANIES				
O	BOOTHE COMPUTER CORP	1- 8	7 1/2	+ 1/8	+1.6
O	COMDISCO INC	3- 10	9	- 1/4	-2.7
A	COMMERCE GROUP CORP	2- 3	1 5/8	C	0.0
A	COMPUTER INVSTRS GRP.	1- 3	1 T/8	+ 1/2	+36.3
M	DATRONIC RENTAL	1- 8	1 1/8	0	0.0
A	OCL INC	1- 1	5/8	-	-9.1
N	DPF INC	5- 8	T 1/8	+ 1/2	+7.5
N	ITEL	6- 15	12 3/8	- 1/4	-1.9
N	LEASCO CORP	6- 20	19 1/2	- 1/2	-2.5
O	LEASPAC CORP	0- 1	1/8	0	0.0
O	NRG INC	0- 1	1/8	0	0.0
A	PIONEER TEX CORP	6- 9	T 5/8	- 1/8	-1.6
N	U.S. LEASING	7- 12	9 7/8	+1 5/8	+19.6

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
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EXCH		PRICE			
		1ST6 RANCE (1)	CLCSE DEC R 1ST6	WEEK NET CHNCE	WEEK PC7 CHNGE.
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 3	1 1/4	+ 1/8	+11.1
O	ANACOMP INC	6- 11	6 3/8	- 1/4	-3.7
A	APPLIED DATA RES.	2- 5	4 5/8	+ 1/8	+2.7
N	AUTOMATIC DATA PROC	17- 35	30 3/8	+ 3/8	+1.2
O	COLEMAN AMERICAN COS	2- 6	2 3/8	+ 1/8	+5.5
O	COMPU-SERV NETWORK	3- 10	8 1/2	+ 1/4	+3.0
O	COMPUTER DIMENSIONS	3- T	6 3/8	+ 1/8	+2.0
O	COMP ELECTION SYSTMS	5- 9	5 1/2	+ 1/4	+4.7
O	COMPUTER HORIZONS	1- 2	1 1/2	0	0.0
O	COMPUTER NETWORK	2- 8	6 3/4	- 1/4	-3.5
N	COMPUTER SCIENCES	4- 8	7 1/8	+ 5/8	+9.6
O	COMPUTER TASK GROUP	1- 2	1 1/4	0	0.0
O	COMPUTER USAGE	2- 6	2 1/2	0	0.0
O	COMSHARE	2- 8	6	0	0.0
O	DATA DIMENSIONS INC	2- 4	3 T/8	+ 1/4	+6.8
O	DATATAB	1- 2	1 1/2	0	0.0
N	ELECTRONIC DATA SYS.	12- 19	16 1/4	- 1/2	-2.9
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	INSYTE CORP	1- 3	1 3/4	+ 1/4	+16.6
O	IRS COMPUTER MARKET.	1- 2	1	0	0.0
O	KEANE ASSOCIATES	2- 4	2 1/2	+ 3/8	+1T.6
O	KEYDATA CORP	1- 5	1 5/8	+ 3/8	+30.0
O	LOGICON	3- 8	T 1/2	+ 3/8	+5.2
A	MANAGEMENT DATA	1- 3	2	0	0.0
A	NATIONAL CSS INC	13- 25	20 3/4	+ 7/8	+4.4
O	NATIONAL DATA CORP	4- T	4 3/4	- 1/8	-2.5
A	ON LINE SYSTEMS INC	1T- 23	22 T/8	+2 1/2	+12.2
N	PLANNING RESEARCH	3- 5	3 5/8	+ 1/8	+3.5
O	PROGRAMMING & SYS	1- 1	1/4	0	0.0
O	RAPIDATA INC	2- 5	2 1/8	+ 3/8	+21.4
O	REYNOLDS & REYNOLDS	13- 21	17	+ 3/4	+4.6
O	SCIENTIFIC COMPUTERS	1- 1	3/4	0	0.0
O	TYMSHARE INC	14- 28	18 1/4	+1 1/4	+7.3
A	UPS SYSTEMS	3- 5	3 T/8	+ 3/8	+10.T
N	WYLY CORP	1- T	1 3/8	+ 1/8	+10.0
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	8- 13	11 3/8	+ 3/4	+T.0
O	ADVANCED MEMORY SYS	4- 10	7 5/8	+1 5/8	+2T.0
N	AMPEX CORP	5- 10	6 3/4	+ 1/8	+1.8
O	ANDERSON JACOBSON	2- 4	2 3/4	- 1/8	-4.3
O	APPLIED DIG DATA SYS	13- 25	16 1/4	+ 1/4	+1.5
O	BEEHIVE MEDICAL ELEC	3- 10	9 5/8	+1	+11.5
A	BOLT,BERANEK & NEWN	T- 11	7 3/4	+ 1/4	+3.3
N	BUNKER-RAMO	5- 10	T 3/8	+ 1/8	+1.T
A	CALCOMP	4- 7	4	- 1/2	-11.1
O	CAMBRIDGE MEMORIES	0- 6	3/8	- 1/8	-25.0
N	CENTRONICS DATA COMP	20- 36	25 1/8	+ 1/8	+0.5
O	CODEX CORP	22- 42	33	+2 1/2	+8.1
O	COGNITRONICS	1- 1	T/8	0	0.0
O	COMPUTER COMMUN.	1- 6	4 5/8	0	0.0
O	COMPUTER CONSOLES	4- 7	5 1/4	+ 1/4	+5.0
A	COMPUTER EQUIPMENT	1- 3	1 5/8	- 1/8	-T.1
O	COMPUTER TRANSCEIVER	1- 3	5/8	- 1/4	-28.5
O	COMTEN	4- 8	8 5/8	+ 1/8	+1.4
N	CONRAC CORP	20- 26	26 1/4	+3 1/4	+14.1

EXCH		PRICE			
		1976 RANGE 111	CLOSE DEC 8 1976	WEEK NET CHNGE	WEEK PCT CHNCE
O	DATA ACCESS SYSTEMS	1- 5	4 1/4	- 3/4	-15.0
O	DATA 100	6- 13	6 3/4	- 1/8	-1.8
A	DATA PRODUCTS CORP	5- 15	12 1/4	+1	+8.8
O	DATA TECHNOLOGY	1- 2	1 T/8	- 1/8	-6.2
O	DATUM INC	1- 2	1	+ 1/8	+14.2
O	DECISION DATA COMPUT	1- 4	1 5/8	- 1/8	-7.1
O	DELTA DATA SYSTEMS	1- 1	1/2	0	0.0
N	ELECTRONIC M & M	1- 4	3 3/8	+ 1/8	+3.8
O	FABRI-TEK	1- 1	7/8	0	0.0
O	GENERAL COMPUTER SYS	0- 2	1/4	- 1/8	-33.3
N	HAZELTINE CORP	4- 12	9 1/4	+ 3/4	+8.8
N	HARRIS CORP	34- 57	56 1/8	+2 5/8	+4.9
A	INCOTERM CORP	9- 20	14 1/2	+ 3/4	+5.4
O	INFOREX INC	3- T	4 1/4	- 1/8	-2.8
O	INFORMATION INTL INC	10- 18	12	+ 3/8	+3.2
O	INTEL CORP	4T-109	56	-3	-5.0
A	LUNDY ELECTRONICS	3- 7	3 T/8	0	0.0
O	MSI DATA CORP	3- T	6 3/8	+ 3/8	+6.2
N	MILGO ELECTRONICS	15- 22	20 3/4	+ 1/4	+1.2
N	MOHAWK DATA SCI	3- 10	5 7/8	+ 1/2	+9.3
O	PERTEC CORP	1- 3	1 7/8	0	0.0
A	PERTEC CORP	3- 8	T 1/8	+ 5/8	+9.6
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	2- 10	2	0	0.0
O	QUANTOR CORP	4- 6	5 5/8	+ 3/8	+7.1
O	RECOGNITION EQUIP	6- 11	9 1/2	+ 3/8	+4.1
N	SANDERS ASSOCIATES	6- 11	8 1/8	+ 3/4	+8.9
O	SCAN DATA	1- 4	1 1/8	-	-5.3
O	STORAGE TECHNOLOGY	9- 13	11 5/8	+ 5/8	+5.6
O	T BAR INC	5- 10	6 3/8	+ 1/8	+2.0
O	TALLY CORP.	4- 6	4 3/4	- 1/2	-9.5
O	TEC INC	3- 9	9	+1 1/2	+20.0
N	TEKTRONIX INC	45- 69	62 1/2	-1	-1.5
N	TELEX	2- 5	2 5/8	0	0.0
O	WANGCO INC	11- 22	18 1/2	-2 5/8	-12.4
O	WILTEK INC	2- 2	1/2	- 3/4	-60.0
	SUPPLIES & ACCESSORIES				
O	ADVANCED SYSTEMS INC	1- 4	3 1/4	- 1/8	-3.T
O	BALTIMORE BUS FORMS	3- 5	3 3/8	- 1/8	-3.5
A	BARRY WRIGHT	6- 10	9 1/4	- 1/8	-1.3
O	CYBERMATICS INC	0- 1	1/2	0	0.0
A	DATA DOCUMENTS	25- 45	42 1/4	0	0.0
O	DUPLEX PRODUCTS INC	13- 24	13	+ 1/8	+0.9
N	ENNIS BUS. FORMS	6- 8	6	0	0.0
O	GRAHAM MAGNETICS	8- 13	10 1/2	- 3/4	-6.6
O	GRAPHIC CONTROLS	13- 19	15 1/4	- 1/4	-1.6
N	3M COMPANY	53- 66	55 1/4	-1	-1.T
O	MOORE CORP LTD	32- 51	33	- 1/2	-1.4
N	NASHUA CORP	11- 19	18	0	0.0
O	STANDARD REGISTER	15- 19	17 1/2	+ 1/4	+1.4
O	TAB PRODUCTS CO	5- 11	10	+ 1/2	+5.2
N	UARCO	18- 25	20 3/5	+1	+5.1
A	WABASH MAGNETICS	4- 11	10 1/2	- 5/8	-5.6
N	WALLACE BUS FORMS	19- 25	21 3/4	- 1/8	-0.5

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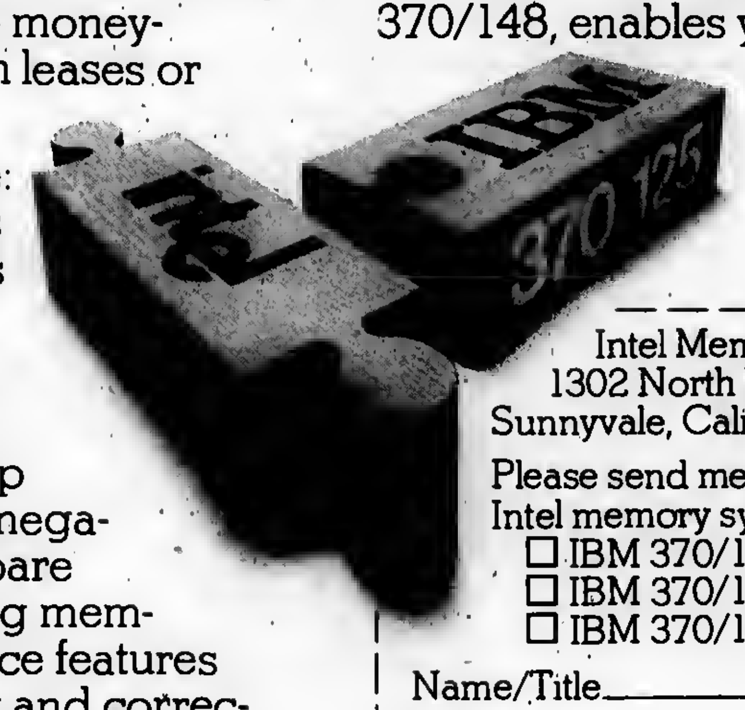

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NEWSPAPER

DP Crime Not Abating – Victims Just Silent

By John P. Hebert
Of the CW Staff

Although there appears to be less in the news about computer system sabotage, the incidence of major computer crimes apparently hasn't subsided.

Rather, corporate victims of computer crimes are more reluctant to release information to a press anxious for sensational news, according to Donn Parker, author of *Crime by Computer* and a researcher at Stanford Research Institute.

The targets of such crimes — usually large financial institutions — may not be publicizing the fact a computer system has been violated illegally because they could lose more from "bad publicity" which damages their competitive position than from the crime itself, Parker said.

Figures for the total corporate loss in terms of time, money and reduced confidence never have been published, Parker indicated, although the U.S. Chamber of Commerce estimated $100 million would be siphoned annually from institutions' computer data banks.

The alarming note is that there could be much worse prospects for businesses and correspondingly better prospects for computer criminals in the future, Parker said in an interview recently.

In Los Angeles, Spencer Nilson, publisher of a newsletter for bank executives and once a credit investigator, said people in credit card organizations like Carte Blanche, Diners Club or BankAmericard are told not to divulge such losses, even though they amounted to $700,000 or more last year and $500,000 in 1974.

"Business executives don't want the losses discussed because it would cause a panic," he said.

Banks comprise a large portion of the victims of computer crime, but

(Continued on Page 6)

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Users Planning to Spend 11% More Next Year

By Nancy French
Of the CW Staff

WALTHAM, Mass. — Users will step up DP spending by an average of 11% in 1977 as a result of heavier workloads and new applications.

This "real growth" contrasts with both 1975 and 1976, when users' budget increases were gobbled up hy inflation, cost-of-living raises for employees and limited new hardware, according to the annual U.S. DP budget survey conducted by International Data Corp. (IDC), here.

Large users' budget increases of 8.5% will be exceeded by those of medium-scale users, who reported 12.7% higher budgets for 1977, the market research firm found.

Key indicators of the positive trends revealed hy the survey include a projected 12.3% jump in hardware spending and virtually no budget cutting, IDC said.

For the first time since the late 1960s, growth in hardware spending will outpace growth in other DP budget categories. Especially significant is the fact that the growth will occur on top of hardware price cuts by the major mainframe manufacturers.

Only three of the 128 large and medium-size organizations in the survey sample anticipate reductions in their 1977 DP budgets — a sharp contrast to recession-constrained 1975 when more than 11% of the sample recorded budget cutbacks.

More than 40% of those surveyed plan a major CPU upgrade or addition during 1977. These expansions in capacity are a direct result of a commitment to data base/data communications as well as the increased workloads users are experiencing, IDC said.

DP employment is expected to grow by 2.8% — slightly less than in 1976 — which is indicative of continued new application development, IDC said.

Expenditures for transmission facilities will rise by 16.7%, also slightly less than in 1976 hut higher than anticipated since most large organizations have already implemented their teleprocessing networks.

The only potentially negative sign picked up in the survey concerned users' plans

(Continued on Page 4)

Wanted: Experienced Antitrust Lawyer

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. — The Department of Justice is looking for someone to replace the attorney heading its antitrust suit against IBM in the event Raymond M. Carlson retires from government service next year as planned.

Some observers of the 19-month-old trial in New York City fear the wrong choice of a successor to Carlson would hamper the government's obligation to finish the case.

They also fear the exodus of government attorneys back to Washington as they finish their portions of the Justice Department presentation in court is "starving" the government team.

O'Leary Turns Down Job

One candidate considered hy the Justice Department for Carlson's job is Howard ("Buck") O'Leary, staff director and chief counsel for the U.S. Senate Antitrust and Monopoly Subcommittee here.

While he talked with the department about stepping into Carlson's shoes, O'Leary declined for personal reasons.

"I was intrigued with the prospect of trying the case and would have considered it a professional challenge," O'Leary said. His reasons for saying "no" had nothing to do with the length of U.S. vs. IBM or with the commitment that would be needed to see it through, he added.

The Justice Department had no comment on the offer it made to O'Leary, according to Lewis Bernstein, chief of special litigation in the department's Antitrust Division.

Carlson "has made it clear he is eligible for retirement in November 1977. It would be imprudent of us not to look for a replacement" in the event the lead attorney decides to exercise his option, he said.

Asked about rumors that he himself might retire at the end of this year, Bernstein replied, "I am not retiring."

Carlson had no comment on the O'Leary offer, but he did confirm his eligibility for retirement on Nov. 2, 1977. If and when the Justice team's head lawyer on this case does announce plans to leave, the judge is likely to be the first to know, he said.

The Justice Department does seem to have cut back on its team in New York over the last several months. In February, the government had 21 full-time attorneys working on the case and 25 full-time support people, including economists, computer advisers, secretaries and clerks.

Last week, Carlson said the team now consists of 17 full-time attorneys and 27 other full-time employees.

Burroughs Adds CPUs For Communications; Prices Unbundled

By Ronald A. Frank
Of the CW Staff

DETROIT — Burroughs Corp. has introduced three communications-oriented processors that feature separately priced hardware and software.

The B870 and B860 systems were designed for electronic funds transfer systems and multilocation message-switching networks; they are compatible with most existing Burroughs mainframes and terminal systems, according to a spokesman.

The communications processors mark the first time Burroughs has separately priced its operating system software as well as its applications packages, he stated.

Three models were introduced. The

(Continued on Page 6)

Could IBMer End Up Responsible For Pursuing Suit Against Firm?

By E. Drake Lundell Jr.
Of the CW Staff

ATLANTA — President-elect Jimmy Carter's transition team is now apparently considering an IBM director for the post of U.S. Attorney General in the new Administration — the one Cabinet post most responsible for prosecuting the government's ongoing antitrust suit against the firm.

At the same time, another IBMer — Jane Cahill Pfeiffer — surprised the Carter camp by taking her name off the list of potential Cabinet members just before she was slated to be named to a post.

The possibility for Attorney General is Patricia R. Harris, a partner in the firm of Fried, Frank, Harris, Shriver & Kampelman, who has been on the IBM board since 1971.

When asked about the likely appointment of an IBM director to a position which could have a major impact on the government's antitrust case, Carter's transition press office said last week it "can't comment on people being speculated about in the press."

Harris has an impressive background. She served as dean of the Howard University Law School and was at one time ambassador to Luxembourg. She has also served as an attorney in the Justice Department and is now a director of the National Association for the Advancement of Colored People (NAACP) Legal and Educa-

(Continued on Page 2)

Season's Greetings and Best Wishes for the New Year

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Did FCC Forget About Justice Opinion Agreeing Dataspeed 40/4 Is DP Device?

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. — The Federal Communications Commission (FCC) may have ignored an opinion from the Justice Department when it decided to authorize a tariff for the AT&T Dataspeed 40/4.

The FCC ruling reversed a decision made last March by the chief of its Common Carrier Bureau, Walter Hinchman. Hinchman rejected the terminal for tariffing on grounds the terminal is a DP device [CW, Dec. 6].

In September — six months after the Hinchman ruling and almost three months before the FCC overruled the bureau chief — a deputy assistant attorney general in the Justice Department's Antitrust Division said in a letter that he agreed with Hinchman.

"Based on the decision of the Common Carrier Bureau that the Dataspeed 40/4 is a data processing service . . . [AT&T] may not engage in the business of selling or leasing such equipment, whether directly or through a subsidiary," Jonathan C. Rose wrote.

While "data processing services as such . . . are not directly regulated by the commission at present," Rose noted that in 1956 "AT&T entered into an agreement that the Bell System would restrict its activities generally to offering communications services subject to public regulation.

"Hence the bureau chief's factual determination [under] the commission's rules and the 1956 agreement read together could mean AT&T cannot market the Dataspeed 40/4 terminal to the general public," the Justice Department letter said.

Court Must Decide

Addressing the question of whether the terminal is a communications or DP service, the letter said, "In the final analysis, the district court which entered the [Consent] Decree is responsible to determine what is or is not a 'common carrier communications service.' The Department of Justice has consistently been of the opinion that [heing] tariffed at the state level alone does not resolve the question.

"In order to constitute a permissible activity under the [Consent Decree], the offering must be a communications service or facility and be subject to public regulation," Rose said.

A spokesman for the Common Carrier staff said the Justice Department had assumed in its opinion that Hinchman's ruling — that the Dataspeed 40/4 is a DP device — was correct.

"If the commission were to make different assumptions, then the Justice Department letter is irrelevant," the spokesman said: "If you assume that the Dataspeed 40/4 is not a data processing device, then the Justice assumptions don't hold."

"We didn't say we necessarily agreed with the bureau chief's determination," a Justice Department source said. But if the FCC finds the terminal is a communications device, then Justice "will live with the decision"; the actual determination rests with the FCC, he said.

Normally in this type of judgment decision the Justice Department defers to the FCC. In this situation, however, there was a dispute within the Common Carrier Bureau and within the commission as to whether this device is a DP or a communications service, he pointed out.

It will therefore be up to the U.S. District Court in New Jersey (which wrote the Consent Decree) to decide how the Dataspeed 40/4 should be classified, he said. But it will be the responsibility of one of the parties to bring this to the court, he added.

The FCC's decision to tariff the AT&T terminal may have been made without sufficient evidence or a formal proceeding to hear the merits of the issue, several regulatory experts said, but the Justice Department source said it would probably be hard for a court to find the commission had acted in an arbitrary or capricious manner.

The final determination will depend on the outcome of the second Computer Inquiry, he said.

NBS Approves IBM Algorithm As Federal Encryption Standard

By Don Leavitt
Of the CW Staff

WASHINGTON, D.C. — A data encryption algorithm designed to provide a high level of security for information stored by and transmitted between computer systems has been approved as a Federal Information Processing Standard (Fips) by the National Bureau of Standards (NBS).

The official publication date for the standard is expected to he Feb. 15. Six months after publication, the standard will become effective for federal DP organizations, an NBS spokesman explained.

Encryption is accomplished by electronic devices that implement the mathematical algorithm specified in the standard, NBS said. The algorithm was developed by IBM, which has agreed to grant nonexclusive, royalty-free licenses under its patents to make, use and sell electronic devices which comply with the standard, the bureau added.

To place the new standard in perspective with other computer security measures, NBS will hold a conference on Feb. 15 at its Gaithersburg, Md., facilities. Those interested in attending should send a $25 registration fee to Anne Shreve, NBS Systems and Software Division, Washington, D.C. 20234, the bureau said.

Copies of the encryption standard, published in Fips Publication 46, will be available — at a price yet to be determined — from the National Technical Information Service, 5285 Port Royal Road, Springfield, Va. 22161.

Carter Considering IBM's Harris

(Continued from Page 1)

tional Defense Fund, as well as serving on the boards of the Chase Manhattan Bank, Scott Paper Co. and Georgetown University.

Harris is one of three IBM directors with a shot at landing a job in the Carter Administration. Cyrus Vance has already been designated Secretary of State and Harold Brown is in the running for Secretary of Defense [CW, Dec.13].

In addition, Dr. Lewis Branscomb, IBM vice-president and chief scientist, is one of Carter's major advisers on science and technology policy and may land a job as Presidential science adviser.

However, in a last minute move, Pfeiffer, a former IBM vice-president, told Carter she didn't want to be Secretary of Commerce after all.

The surprise announcement came here last week at the time it was expected Carter would name her to that post.

Pfeiffer said she didn't want to move away from her husband — Ralph A. Pfeiffer, a senior vice-president at IBM — to take the job.

In addition, she noted she had thyroid surgery a year ago and did not feel she would be up to the strenuous demands of the job.

Pfeiffer is the second person with IBM ties to ask not to be named to a Cabinet job.

Earlier, Irving S. Shapiro, an IBM director, asked to be removed from consideration for the job of Treasury Secretary. However, he remains a close adviser to the President-elect on business matters.

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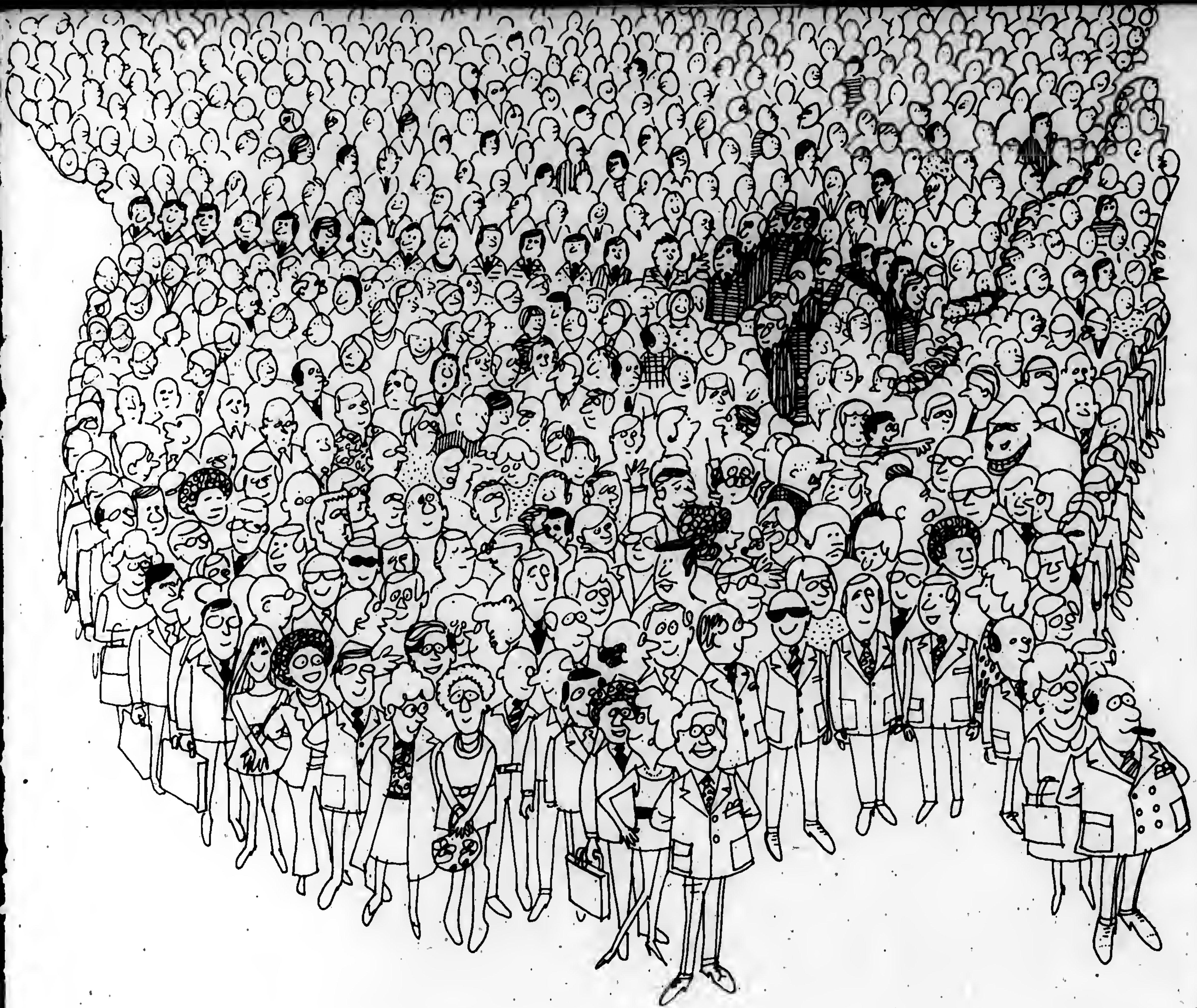

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Earlier Decision at Stake

FCC Hears Last Debate on Western Electric Divestiture

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. — The Federal Communications Commission (FCC) heard the final round of arguments here last week on whether Western Electric, the manufacturing and supply arm of the Bell System, should be divested from the communications firm.

The hearing was the most recent step in the FCC's six-year proceeding designed chiefly to determine whether Bell charges for interstate long distance telephone service to telephone and terminal users are lawful.

Many of the issues in this FCC Phase II Study are similar to those raised in the Justice Department's antitrust suit against AT&T, but the FCC investigation predates the suit and is a separate proceeding.

The commission met to hear exceptions to the initial decision on Aug. 2 by David I. Kraushaar, FCC administrative law judge. Kraushaar concluded the Bell System structure — consisting in part of Western Electric, Bell Laboratories and the operating telephone companies — serves the public interest and ought to be maintained.

In addition, Kraushaar decided AT&T's interstate long distance rates and charges are reasonable and just and the revenue levels of its operating companies are "reasonable and capable of" returning to the Bell System the 9.5% to 10% currently prescribed by the FCC.

Maintaining the self-sufficiency of the Bell System results in efficient service and lower costs to users, AT&T counsel Howard J. Trienens of Sidley & Austin in Chicago and Washington, D.C., argued the commission should affirm Kraushaar's rulings.

But the FCC's Common Carrier Bureau trial staff, led by Joseph A. Marino, posed divestiture of Western Electric as the only long-term way to open the communications market, both inside and outside AT&T.

Broad Competition Urged

Pointing out that Western Electric is not a public utility, not a monopoly and not regulated by the FCC, Marino said the wholly owned AT&T subsidiary should be made to compete in the broader marketplace.

As interim relief, he suggested the FCC order Bell to have Western Electric sell its equipment to independent general trade companies that could then "fight it out" with AT&T in the marketplace.

FCC chairman Richard E. Wiley repeatedly asked for alternatives between divesting Western Electric and leaving the Bell System intact. Quoting Kraushaar, Wiley asked Marino if divestiture wasn't "a simplistic, doctrinaire siren song which would be unwise at best and catastrophic at worst."

Other commissioners questioned whether their regulatory authority extends beyond protecting the public interest to ensuring competition in the telecommunications industry.

Immediate Action Asked

Trienens argued the FCC should resolve exceptions to the Kraushaar decision now rather than wait for a ruling in U.S. vs. AT&T. While competition is a relevant indicator of service to the public, it is not the essential element with which the FCC is concerned, he contended.

"Not to decide this case after all this record," Trienens said in referring to some 15,000 pages of exhibits and 16,000 pages of transcript, "is not an option."

The trial staff suggested the commissioners might want to wait for the outcome of U.S. vs. AT&T and an attorney from Stromberg-Carlson Corp. called the FCC procedure "an inappropriate means of treating the issue of competition."

Regardless of "whether the court decision [in U.S. vs. AT&T] involves divestiture of Western Electric, we think it will take a deeper look at the market data and potential remedies than was done in the initial decision here," the Stromberg-Carlson attorney said.

Stromberg-Carlson and International Telephone and Telegraph Co.(ITT) agreed that if Western Electric is permitted to maintain a monopoly in the Bell System and enter the independent market and if the independents don't enter the Bell market, the AT&T subsidiary will acquire a total monopoly except where vertically integrated companies exclude it.

ITT asked the FCC to go beyond Kraushaar's decision and stop Western Electric from being the purchasing agent for Bell Labs. The Bell competitor did not support divestiture, however, urging the commission instead "to change the internal structure of the Bell System so that it regulates itself."

Wiley has pledged that the commission will reach a decision on the question of divestiture by March 1. The FCC will also rule by then on whether the long distance rates are lawful and whether certain expenses — like charitable contributions and advertising — should be kept in the rate base and so charged to telephone user.

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Users Planning to Spend More

(Continued from Page 1)

beyond 1977, the report said.

Very few users contemplate any concrete expansion beyond next year, indicating any action they take will depend on new product introductions.

Figures were derived only from survey interviews and do not include data from small-scale or entirely new computer users, IDC noted. However, since large- and medium-scale users account for about 75% of DP expenditures, this annual survey has usually provided a good approximation of what to expect.

Users are allocating 35% to 40% of their budgets for hardware. For large users, this represents a 10.2% increase over last year and, for medium-size users, a jump of 13.7%.

A majority of users interviewed were near or had reached the maximum workload that can be sustained on their current configurations, and 42% reported operating central computers 18 or more eight-hour shifts per week. The average utilization for the entire sample was 15 eight-hour shifts per week, the highest figure ever recorded in IDC's annual survey.

'All-IBM' Attractive

Price reductions by all the large mainframers combined with the introduction of plug-compatible CPUs have interested many users with smaller rented or leased systems in upgrades, IDC said. As many as 60% of those users surveyed plan to upgrade.

These reductions are also causing a few of the larger, "more sophisticated" users in the sample to question the viability of distributed processing via minicomputers. Some users also indicated an "all-IBM" approach now appears more economically attractive, IDC said.

The introduction of peripherals that offer more attractive price/performance ratios are also "luring" many users into an acquisition mood for 1977, IDC said.

High-density disk drives — especially the IBM 3350 — are reducing the overall cost per stored character to the point where many users are now converting formerly tape-based jobs to disk.

DP employers appear to be less inclined to grant the generous salary increases seen in past years — a reflection of reduced inflationary pressures in the economy as a whole, IDC noted.

DP salaries should increase by 6.2% in 1977, a notch below this year's 7.5% average increase.

Only 2.8% of the sites surveyed will hire new employees compared with 4.5% last year, but programmers and analysts with data base and data communications expertise will continue to be in high demand.

However, more efficient, less people-intensive disk-based operating environments and increased use of on-line data entry and transaction processing will continue to reduce job opportunities for computer operators and keypunchers.

Although users will spend what sounds like a low zero to 10% on transmission facilities in 1977, this represents a 16.7% jump over last year's projections, making transmission facilities the most rapidly growing item in the DP budget.

IDC attributed this to network expansion by existing large-scale users as well as new networks for medium-scale users.

As for supplies, the inflationary pressure on paper supplies has "virtually ceased," according to IDC, and spending increases in this category are a result of increased usage.

Prices for magnetic media such as tape, cassettes and disk packs appear to be eroding despite price hikes for raw materials. Users said they are saving money by competitively bidding quantity media purchases.

Users wishing to avoid increases personnel and programming costs will continue to purchase outside software packages when they fulfill program needs.

DO YOU WISH FOR A LIST OF KIDS WHO ARE
A. NAUGHTY?
B. NICE?
SELECT_

Minor Inconsistencies Mar Experts' Calcomp Testimony

By Molly Upton
Of the CW Staff

LOS ANGELES — Three expert witnesses in the California Computer Products, Inc. (Calcomp) vs. IBM antitrust case here all testified IBM dominates the markets for computers and peripheral equipment.

But IBM's lead attorney was able to point out inconsistencies in the testimony of each, which may affect how the jury views their overall evidence.

The three testified IBM held a majority share of the general-purpose computer market between 1966 and 1972, but two of the witnesses had to correct minor points in their statements on cross-examination by IBM attorney David Boies. The third indicated he didn't really understand the basis of some statistics he used.

Boies pinpointed a few discrepancies when interrogating University of Arizona assistant professor of economics Gerald W. Brock on market share data compiled from Census I.

Census I includes data on DP product revenues between 1952 and 1970 from 751 of the 2,827 firms polled as part of Control Data Corp.'s antitrust suit against IBM.

Brock's study on the general-purpose systems market contained a $100 million overvaluation of installed IBM 2402 tape drives, he admitted under Boies' questioning.

The professor said this would reduce IBM's share in 1970 from 63.8% to 61.5% in the market which included general-purpose CPUs, tape and disk drives, line printers, card readers and other products that satisfied the criteria of demand and supply substitutability.

Brock initially said his statistics were accurate within ± 2% between 1963 and 1967 and ± 3% from 1968 to 1970.

Study's Calculations Questioned

Boies also led Brock to agree his study omitted $7.9 million in revenues generated by Potter Systems and raised the question of how $30 million in revenues from Ampex Corp. were allocated in the study.

However, on his second day of testimony, Brock told Calcomp attorney Max Blecher his recalculations on these and other matters would reduce IBM's share only .9% for a total of 62.9%.

These recalculations also included considering a response to the Census I from Calcomp, which was originally excluded because Brock deemed it lacked sufficient information.

Brock had previously estimated IBM's share of the general-purpose systems market at an average 78.4% between 1961 and 1965 and at 70.7% between 1966 and 1970.

Including minis and specialized peripherals, terminals, communications gear, maintenance equipment and specialized application units, however, IBM's share was somewhat less, averaging 75% between 1961 and 1965 and 65.6% between 1966 and 1970, he said.By including teletypewriters as well as the other factors in the broader market, IBM's share in 1970 was reduced from 58.1% to 56.4%, he testified.

Avoids Quick Answers

Patrick J. McGovern, chairman of International Data Corp. (IDC), began to visibly suffer from jet lag during his first afternoon on the stand. He made misstatements on two issues while attempting to avoid giving yes or no answers.

In one instance, McGovern indicated IBM's share of disk drives attached to IBM CPUs did not include the 3340. He later corrected himself upon Boies' urging.

After a long series of questions by Boies, McGovern indicated IDC calculated the value of plug-compatible manufacturers' (PCM) installations of double-density 2314-type drives based on the value of IBM's double-density 2314s. But IBM never offered such a product. Blecher established McGovern had been thinking of the calculations involved in determining values for the double-density 3330.

During his second day of testimony, McGovern explained he didn't like giving yes or no answers because Boies' terminology was often inconsistent with his own.

At one point Judge Ray McNichols told Boies to cease attempting to elicit one-word answers. With that technique, he said, one can ask questions such as "Has the man stopped beating his wife?"

Effective Phone Call

Montgomery Phister Jr., a writer and consultant, also testified on the market share issue. His most recent position in the industry was vice-president of engineering at Xerox Data Systems, which he left in 1972.

Phister's testimony escaped relatively unscathed, but Boies attempted to illustrate that Phister did not understand the complexities behind the data that he used, most of which came from IDC.

Boies revealed that Phister had not updated his statistics, as IDC had, to reflect data from IBM on its installations which the corporation had released under court order in a previous case. Phister included both the original IDC figures and the data released by IBM, but did not correlate the two.

Later, Boies picked up the witness' remarks from a book he had written which called industry data "staggeringly unreliable." Phister said the phrase was "exaggerated hyperbole" designed to attract attention.

Phister indicated the percentage of IBM moving-head disk drives on IBM CPUs in the U.S. declined from 93.8% in 1970 to 84.5% in 1972, thus reflecting incursions by PCMs.

On a broader basis, IBM-made spindles on IBM systems accounted for 79.4% in 1970 and 67% in 1972 of all spindles on all systems in the U.S., he said.

On the second day, Phister turned examiner and asked a question of Boies while being interrogated on whether the value of PCM gear and terminals was included in IDC's values of general-purpose systems.

Phister indicated he thought it was, but as IBM President John R. Opel and chief counsel Nicholas deB. Katzenbach looked on, Boies backed off from that line of questioning.

"I thought I was right, but you've shaken my confidence," Boies said, indicating he would check some background during the luncheon recess.

But Phister did some checking of his own, reaffirming through a telephone call to IDC that he was correct in his understanding of IDC's philosophy in valuing systems.

This set Boies somewhat aback when he asked Phister how he knew, and Phister indicated he'd talked with "Mr. Mertz" at IDC.

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Burroughs Adds Three Communications-Oriented CPUs

(Continued from Page 1)

B866-1 is a 1 mHz system with main memory up to 114,668 bytes; the B866-2 is a 2 mHz machine also with a main memory of 114,668 bytes; and the larger B876 which is a 2 mHz system that has memory capacity of 147,456 bytes.

Operate With DCPs, Gemcos

The communications CPUs operate with Burroughs Data Communications Processors (DCP) and can perform as switches or remote communications nodes in a network.

The systems can operate with a newly introduced Generalized Message Control System (Gemcos) which contains modules for communications functions that include network administration, audit and recovery, routing, concentration and network statistics.

Gemcos costs $4,000 on a one-time charge or $133/mo on a three-year lease and $128/mo on a five-year rental.

Gemcos runs with a store-and-forward message-switch software system designed to handle both on-line and delayed transmission applications. This switch software is designated B800MS and costs $20,000 on a one-time charge, $667/mo on a three-year lease and $640 on a five-year plan.

Gemcos operates with the earlier Burroughs Message Control System which in turn operates with the Master Control Program (MCP).

The MCP costs $2,500 on a one-time charge or $70/mo on a continuing charge basis.

Both the B870 and B860 are microprogrammed systems which use a group of microinstructions called interpreters that reside in an alterable control memory.

Multiple interpreters can be run on the systems and up to six programs written in different languages can be processed concurrently in the control memory, according to the spokesman.

Both RPG and Cobol are supported in the systems.

Two disk storage subsystems, ranging from a cartridge with 145-msec average access time up to a high-speed disk pack with 33.3-msec average access, are available with the three models. Other standard Burroughs tape, card, printer and CRT devices are compatible with the CPUs, he said.

The DCUs for the B870 and B860 can operate at speeds from 9,600 bit/sec up to 64 kbit/sec on broadband facilities.

The processors can also be used in data entry applications and as multistation key-to-disk systems which later transmit preprocessed data to central site, the spokesman indicated.

Burroughs B860

Burroughs remote job entry support is available as well as Hasp software that allows the B870 or B860 to operate as an IBM workstation in an IBM network, he added.

The RJE packages cost $1,260 on a one-time fee, $33/mo on a three-year lease or $31/mo on a five-year lease.

The systems operate within the Burroughs data communications architecture which utilizes Burroughs Data Link Control and is compatible with IBM's Synchronous Data Link Control, the spokesman said.

An entry-level B866-1 with a DCP, disk-cartridge subsystem, CRT console display and 64K of storage costs about $33,000 or "less than $1,000/mo," he noted.

A high-end system using the B876 with DCP, 98K of storage, CRT console, 4.6M-byte disk system and 250 line/min printer costs $75,000 or $2,300/mo. Both configuration prices are for hardware only.

First deliveries of the B866s are scheduled for the first quarter of 1977 with the B876 slated for third-quarter delivery.

DP Crime Not Waning, Victims Just Keeping Quiet

(Continued from Page 1)

keep strictly confidential records on losses experienced through such means, according to Nilson.

A bank will often reveal the write-off losses from five years back as evidence that such a crime ever occurred, he added.

The average computer "holdup" at a bank is about $100,000. "That's 10 times as great as robbery, but nobody at the bank knows about it until it's too late — there are no guns and no people present at the time of the crime," Nilson said.

And there is no agency in the world established to tell the public of computer fraud losses, he noted.

Computer fraud happens because it's done secretly and silently, Nilson said.

"A programmer could easily do it at the bank and nobody would know because there's no way to monitor such losses and the individuals responsible for the crime are not prosecuted in many cases. Unless you have proof, you can't confront the person," Nilson asserted.

Criminals Improving Techniques

While precautions to combat computer crime are becoming increasingly sophisticated, criminals are improving techniques to meet the challenge. Worse still, there are fears that organized crime is entering the lucrative field, according to Parker.

Working from the available documentation, Parker maintains white-collar workers were and are responsible for the overwhelming bulk of high-technology crime.

He said only four cases out of 430 involved organized crime, but agreed there is "whispering down the hallway" about a possible influx of crime syndicates into the predominately white-collar area.

Parker planned to testify at last week's hearing of the National Commission on Electronic Funds Transfer (EFT) in San Francisco that EFT systems, for example, are an ideal area for the involvement of organized crime.

Robert Bullock, superintendent of the Illinois Bureau of Investigation (IBI) admitted he has received tips that organized crime has an interest in the high-technology, big-money swindles.

Although Bullock said the IBI has "intelligence information" that organized crime wants a piece of the computer crime action because it is a fertile new field, he neither knows how common it is nor whether any incidents of such kind have occurred in Illinois.

Bullock indicated he didn't want to divulge any unsubstantiated information. "We're more interested in establishing the fact it exists," he said.

"It's a very practical and possible thing; it's not controllable," Bullock said, adding the IBI may look intensely at the situation if the magnitude warrants.

Bullock denied making a statement appearing in a Chicago newspaper that the crime syndicate has already scored financial hits through computer operations by opening a bank account, learning the bank's computer access code with the help of an insider and using portable equipment to transfer money into the account.

He did agree, however, that a crime syndicate would need key information, key people and sometimes sophisticated equipment to score hits on computer systems.

Computer crime "is something people should take a hard look at and systems should have every precaution for protection. And there should be a periodic evaluation of any system" containing information representing goods or money, Bullock said.

"It's a mistake to think the system will last forever," he added.

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Can't Tell Long-Term Effects

Glaser Urges Caution in Developing EFT

By E. Drake Lundell Jr.
Of the CW Staff

HANOVER, N.H. – The widespread use of electronic funds transfer (EFT) systems will have a great impact on society, but the long-term effects are hard to anticipate, George Glaser, an independent consultant, said at the Dartmouth College symposium on "Man and the Computer" here last week.

Acknowledging he was not as much "a doomsayer as some," Glaser nevertheless urged caution in the development of EFT systems.

A past president of the American Federation of Information Processing Societies, Glaser said a wide variety of EFT services and systems are being rushed out by an equally wide variety of organizations and interests with different ideas and motives.

"This is not a thoughtful process now," he indicated after surveying the competing interests in EFT development.

No Standardization

While there are currently no technological problems with EFT, there are problems of other kinds, Glaser said. One of them is a lack of standardization.

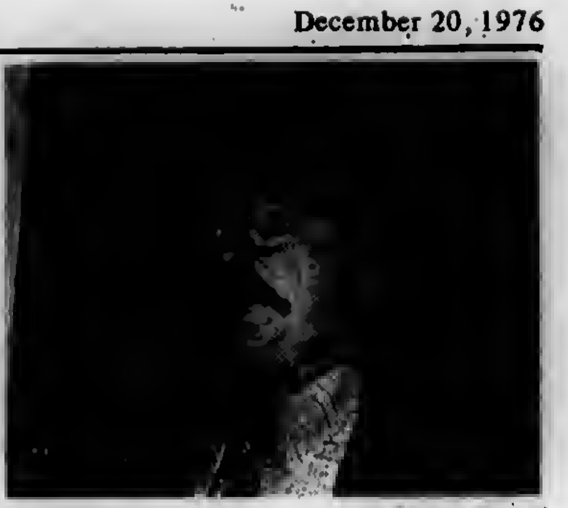
Many of the systems are being designed by regional and local groups who have developed no standards for the envisioned national hookup of the various systems.

Another problem confronting EFT is that of consumer acceptance, Glaser said, noting that recent studies have come down on both sides of this issue.

The economics of the systems are also not really well known, Glaser pointed out. Many competing firms and organizations are either in or planning to get into the field, which could lead to either an underestimation of the capacity needed for such systems or an overestimation of the needs, resulting in price cutting and possible havoc in the marketplace, he said.

The establishment of EFT systems, Glaser noted, is capital-intensive so there will be a need for high transaction levels in order to repay the investment. This may lead to further price cutting as competitors in the market try to reach those necessary transaction levels.

Legal, legislative and judicial opinion is "murky" on EFT applications, Glaser said. At present there is "a lot of noise" surrounding the issue, but no clearcut policy at any level of government.



CW Photo by R. Frank

George Glaser.

The major questions that need to be answered about EFT, he said, are what is the role of the Federal government, to what extent the systems should be shared, what policy will produce the needed compromises between the competing interests, who is responsible for the systems and who will safeguard the systems.

These questions can be answered, Glaser indicated; he noted he personally is looking forward to the advent of EFT systems.

But, he said, people should have the option to use or not use the systems.

"I think we will get that option," he said.

Directory Under Way For DP Hobbyists

CAMBRIDGE, Mass. – A directory for computer hobbyists is being compiled to help subscribers keep in touch with each other and to provide information in an easy-to-find form.

The "Personal Computing Directory" data base will contain the name, address and telephone number of each subscriber. Clubs, societies, newspapers and magazines geared to the computer hobbyist will also be listed.

The directory, slated for publication in February, will also include manufacturers, stores, repair services, conventions, courses and contests – in short, almost anything of interest or of informational value to the hobbyist.

The data base is maintained on-line on a large mainframe capable of using either Fortran or PL/1.

The List Information Processing System (Lips) consists of a special-purpose editor for adding, deleting and changing items, three programs for typesetting and directory listings and one for printing mailing labels.

The directory will be divided into three parts, with addresses listed geographically by Zip Code, alphabetically and alphabetically by subject.

Listing and advertising in the 200 to 300 page directory is free. The directory will be sold for $4.95 from "Personal Computing Directory," Box 134, Harvard Sq., Cambridge, Mass. 02138.

Calendar

Jan. 9-12, New York — **National Retail Merchants Association (NRMA) 66th Annual Convention.** Contact: NRMA, 100 W. 31 St., New York, N.Y. 10001.

Jan. 10-12, Lake Buena Vista, Fla. — **OCR Users Association Winter Conference.** Contact: OCR Users Association, 10 Banta Place, Hackensack, N.J. 07601.

Jan. 10-12, Madison, Wis. — **Interfacing Instrumentation and Control Hardware to Minicomputers,** presented by the University of Wisconsin. Contact: James E. Nicholls, Department of Engineering, University of Wisconsin-Extension, 432 N. Lake St., Madison, Wis. 53706.

Jan. 16-19, Atlanta — **Bank Administration Institute's (BAI) Eighth National Conference on Bank Security.** Contact: The Meeting Services Division, BAI, P.O. Box 500, Park Ridge, Ill. 60068.

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Editorial

A Time to Reflect

There are just five days left before Christmas and, with the hustle and bustle of year-end reports piled on top of last-minute shopping, it is often easy to forget the true nature of the season that is upon us.

All major religions have a celebration around the time of the mid-winter solstice — be it Christmas, Chanukah or whatever. But most people, whether religious or not, cannot help feeling the holiday spirit.

It is a time to reaffirm life even in the darkest days of winter. A time to reflect and rest for the year ahead.

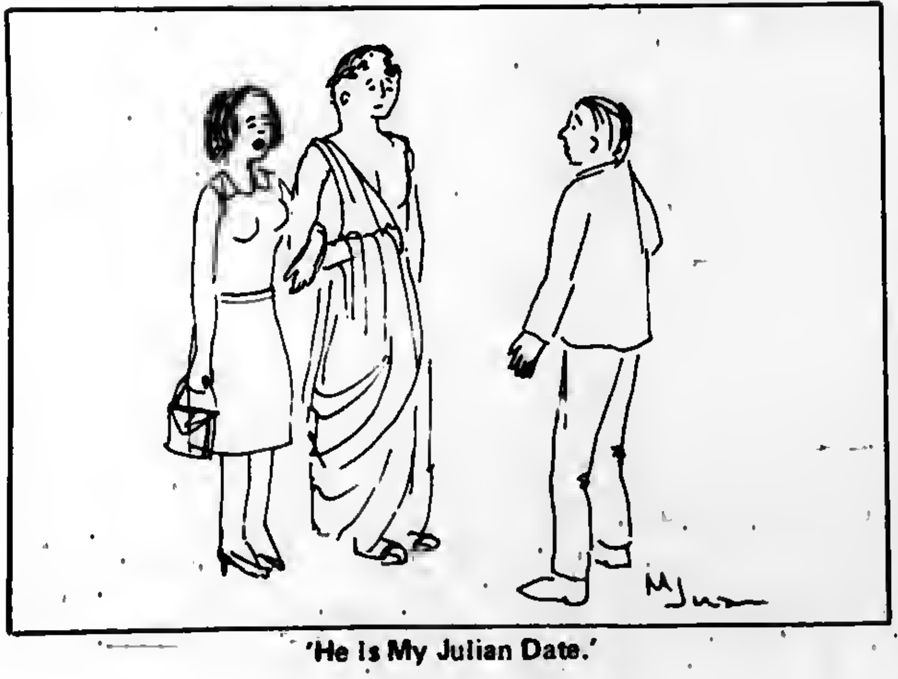
Too often this is lost in the bustle of the season and in its commercialism. Christmas sales statistics are combed over by the economics profession for hints of recovery or depression in the economy, politicians use the occasion for the mouthing of platitudes and too many people worry just about the material aspects of the occasion and the upcoming football games.

But we should all use this time to pause and reflect, to study ourselves and our lives.

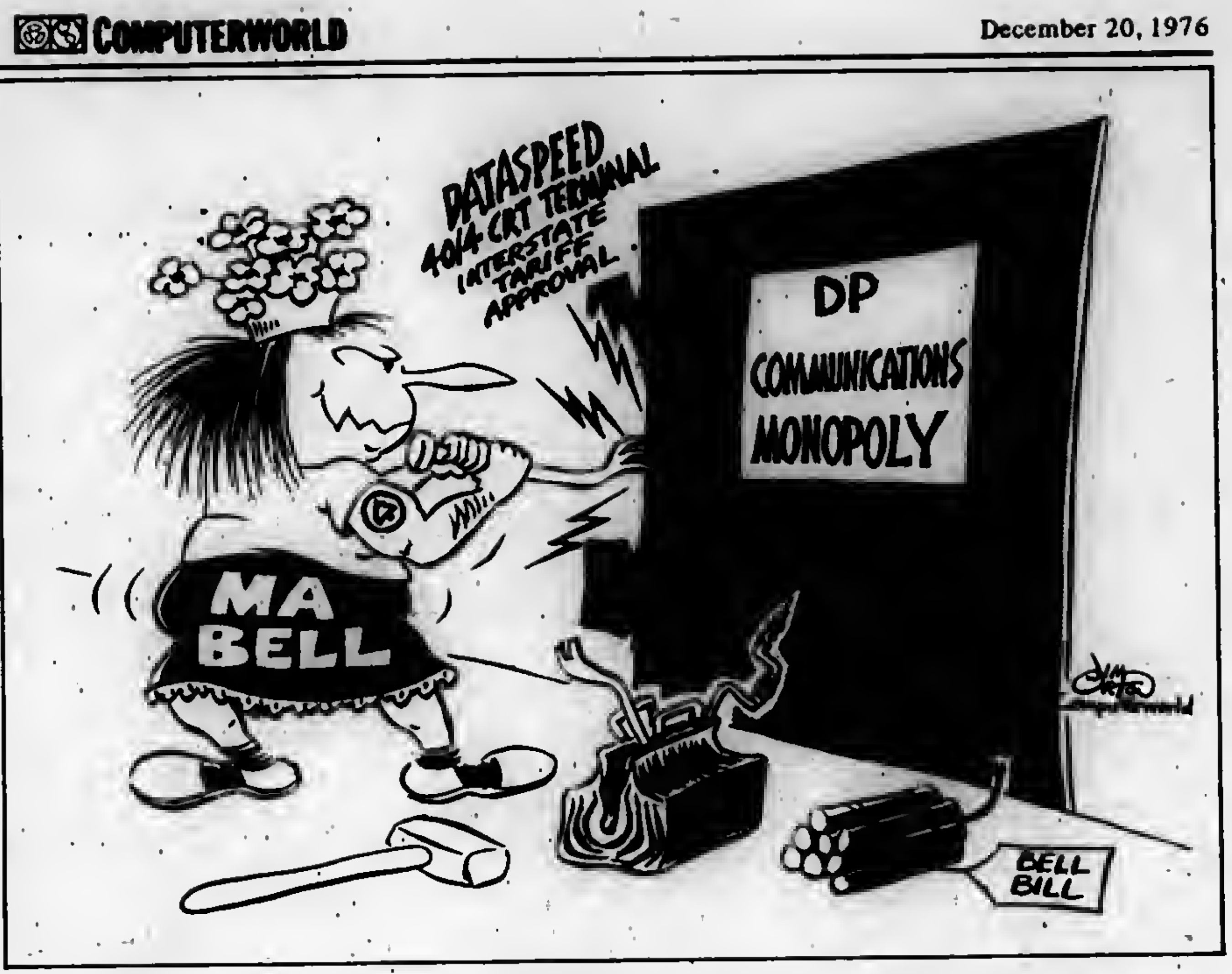
Maybe that way we can carry some of the spirit of the season over into our professional and personal lives in the new year.

And in that way make it the best year ever.

Season's greetings!



'He Is My Julian Date.'


DATASPEED 40/4 CRT TERMINAL INTERSTATE TARIFF APPROVAL
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Letters to the Editor

Fried Made Some Good Points And Then Ignored Them All

In his article, "Without Regulation, DP Professionalism Only a Myth" [CW, Dec. 6], Louis Fried made some very good points regarding DP "professionalism" and then proceeded to ignore them all by suggesting the creation of a new federal regulatory commission.

The "professions" he cited (medicine, law and athletics) each have their standards enforced by peer organizations, by contracts or by statutes — not by bureaucrats.

The sad history of the Washington alphabet soup (CAB, ICC, FDA, FTC, FCC, NLRB, DOT . . . ad nauseum) could hardly inspire one to expect an additional federal agency to produce anything more than the usual peddling of influence, protection of incompetence, stifling of innovation and restraint of competition which has cost the American consumer untold billions in the past.

I am tired of reading all the agonizing about whether DP is a "profession." Perhaps a discipline becomes a "profession" when its trade publications cease worrying about what the word means.

Professionalism is really nothing more than the responsibility for one's own work and for its consequences.

Federal agencies have hardly made positive contributions to the "professionalism" of the jobs they now regulate, such as truck drivers, insurance sellers, gun dealers, labor leaders, letter carriers, social workers or tea tasters. Perhaps this is because government itself is, by its very nature, unregulated.

Bruce A. Martin

Middle Island, N.Y.

Aspects of Professionalism

Professionalism means producing high-quality work. It also means being subject to a set of sanctions above one's employment situation, as Louis Fried noted.

Since this aspect of professionalism has eluded DPers as yet, perhaps another perspective on the topic is needed.

Professionalism also means the kind of work performed. My father (who was a minister) used to say that a professional is one who serves the basic needs of man. The doctor serves his physical needs, the lawyer his societal needs, the minister his spiritual needs and the educator his intellectual needs.

Where does the DPer fit in?

David Ibach

Northville, Mich.

Conversion Incorrectly Corrected

In his letter [CW, Dec. 6], Larry Kintisch used very clumsy Cobol. At issue is the conversion by M. Curtis Stordahl in his article [CW, Nov.15] on the PL/I "DO WHILE C" into Cobol.

The correct minimal conversion, according to the Cobol standards (both 1968 and 1974), is "DO NEST-4 UNTIL NOT C," where NEST-4 corresponds to the loop body.

The Kintisch form of "IF NOT C THEN PERFORM NEST-4 UNTIL NOT C" will probably work, but might create unnecessary extra code. The heart of the matter is that both Cobol and PL/I use the "test first" form of the loop, in contrast to Fortran's historic use of the "test last" loop.

The best possible world would contain a "test where you want to" loop, such as Applied Data Research's Metacobol and the University of Toronto's Project Sue systems language provide.

Howard E. Tompkins

Indiana, Pa.

Computerworld welcomes comments from its readers. Preference will be given to letters of 150 words or less. *Computerworld* reserves the right to edit letters for purposes of clarity and brevity. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

Data Past

Five Years Ago
Dec. 22, 1971

WASHINGTON, D.C. — The federal price commission ruled IBM could raise rental maintenance prices by up to 8% for almost all of its CPUs. The rates had been frozen under Phase I of President Nixon's price and wage freeze program.

— — —

WASHINGTON, D.C. — The Independent Data Communications Manufacturers Association (IDCMA) charged AT&T's Data Access Arrangement (DAA) "discriminated against customers providing their own modems and other [non-carrier] equipment."

Eight Years Ago
Dec. 25, 1968

ST. PAUL, Minn. — Control Data Corp. filed suit against IBM on antitrust grounds charging IBM had breached the Sherman Act both through actual and attempted monopolization of interstate and foreign computer markets and submarkets. The complaint asked treble damages for past violations of the Sherman Act as well as injunctive relief against continuing violations.

— — —

SAN FRANCISCO — The financial condition of the Association for Computing Machinery (ACM) worsened over the last five months, according to an ACM Council meeting here. The net worth of ACM, estimated in June at $70,000, was not provided this time, but the deficit was thought to be not greater than $120,000.

Regular Appraisal Needed to Check Value of Service

The Human Connection

By Jack Stone

Special to Computerworld

There are many strategies which small users can employ to solicit the help of DP center management in solving their problems, but one of the most potent is that of persistence.

This approach is vividly illustrated in an interview I recently conducted with Robert Currie, director of evaluation/domestic programs for Action, the U.S. Federal government agency responsible for worldwide volunteer programs for social services.

The moral of this story is that DP managers should regularly appraise the services they render to all users to assure the validity of their DP operation.

Q: Bob, what has been the history of your involvement with federal volunteer programs?

A: I have been associated with volunteer programs for about eight years. Both Caroline, my wife, and I were Peace Corps volunteers. Along with our son, Robert, we spent 1964 to 1971 in the Philippines and Micronesia, working to train local public school teachers and to develop volunteer programs.

After this tour, I returned to become an independent consultant, specializing in social program evaluation. I then reentered government service in 1974 to take my current job.

Q: Can you briefly describe the nature of your department's task relative to Action's mission?

A: Surely. Within its responsibility for domestic program evaluation, my department makes assessments of the validity of and progress toward program goals and objectives, the impact of programs on the recipients of services and the program benefits compared with costs. It also makes recommendations to Action management regarding expansion and realignment of programs to improve performance.

Q: What DP services do you need in your department?

A: To support our evaluations, we perform certain statistical studies of volunteer activity and program performance. Information on volunteers is generated from the Action Domestic Operations Reporting System (Dors), which is controlled by the Action Computer Services Division. This division provides systems and programming services to all Action departments.

The volunteer file that we use contains biographical data, service dates, training history and associated project information. We have developed an independent file on program performance from our own personal questionnaires, field surveys and other sources.

Q: And when you first arrived at your department, what was the status of computer services support to user departments?

A: Well, let me first say that when I started in my current job, I had no prior experience or background with computer-based processing methods and, therefore, I could not judge the effectiveness or efficiency of DP services either for my department or for others. Also, the processing activity in my department was modest in scope; it simply consisted of manual analyses of various routine but lengthy information listings derived from the Dors.

Q: I assume that, shortly thereafter, your needs began to grow.

A: Most certainly. After I was onboard for only six months, we all learned the manual methods were too cumbersome, time-consuming and prone to human error.

I should note that a great help to us during this period was a three-day class on basic DP systems, presented by a training consultant.

When we felt knowledgeable enough to approach the DPers for support, we learned these people were almost totally engaged in operating and maintaining the Dors and other major systems and a third-generation computer was installed. Although they indicated they would try to do what they could, they stated that since we were a small user we would have to take a low priority in the total workload.

I thought it was wonderful that they would handle our problem at all since we were all just beginning in the business of using computers.

Unfortunately, after about four months, we terminated the efforts with the computer services people because our low priorities made the automation process no more efficient than our current manual processes.

Q: What did you do then?

A: Some friends of ours told us about the Statistical Programs for the Social Sciences (SPSS).

After we told our DPers about the package, they located a version that ran on the in-house machine, However, because of the priority problems, we couldn't get significant results after several months of their efforts. They finally suggested we transfer our tasks to a local government service bureau that could perhaps give us better support.

We went to this bureau, which had a very large and modern computer installation. We started receiving results in a couple of days.

Q: I guess that all is well now.

A: Oh, things are fine. We have since transferred our workload to a commercial service bureau which has certain special capabilities.

Oh yes, I should also mention that while we were running at the government service bureau, the Action in-house machine operations were terminated, the machines were discontinued, the in-house staff was reduced from 70 to about 40 people and the entire high-priority workload was transferred to outside service bureaus for processing.

Confusing Percentages Surround Overbooking Problem

The Taylor Report

By

Alan Taylor, CDP

There appears to be an escalating war between the airlines as to which one has the best overbooking figures. It started in September when United Air Lines, in its *Mainliner* magazine, characterized the situation as follows:

"But how often is someone denied boarding? In United's case over the past 12 months, 16,545 out of 30,350,157 passengers boarded (or far less than 1%) were denied their reserved space for various reasons, including space planning" (which is United's euphemism for overbooking).

After toting the 1974 and 1975 figures together to claim "the lowest rate" of denied boardings in the entire U.S. scheduled airline industry, Allegheny Airlines went one better than the "far less than 1%" claim. In its November *Flighttime* magazine, Allegheny gave some parallel figures about overbooking and its own claim about what they showed:

"During the 12-month period, September 1975 to August 1976, Allegheny carried 10,829,582 passengers and denied boarding to only 5,034 – less than one-half percent."

Actually what the Allegheny figures did show, over and above the fact that apparently neither airline is keeping its decimal points straight when working out percentages, is that there has been a serious increase in the percentage rates of denied boarding.

While the 1974-75 figures were ".3 per 10,000 enplanements" and would anticipate 3,249 denied boardings for 10,852,582 enplaned passengers, the actual figure is 1,815 higher – a 55% increase. Apparently, this is not very satisfactory progress in learning how to avoid the denied boarding problem.

Actually, what is being developed here by both airlines is the concept that overbooking arguments can be settled by comparing the "total numbers of passengers enplaned" to the "total number of passengers denied their confirmed space." This is, of course, nonsense because it dilutes the figures by including passengers flown on nonoverbooked flights.

The apparent conclusion of Allegheny's figures (that denied boardings have jumped 55% in 1976) simply reflects an increase in overbooked flights rather than a decrease in the efficiency of the airlines' overbooking algorithms.

In this case, the problem area (denied boarding) is blamed on the computers and so is our concern. Therefore, we have to do what we can to understand and ameliorate the real problem.

We need to distinguish denied boarding problems from the deliberate overbooking policy itself. Perhaps the best way to do this is to take a management viewpoint of deliberate overbooking and ascertain the benefits and the costs.

From the management's point of view, overbooking is beneficial because it increases revenue. United, for instance, reckoned the 1,559,062 passengers who were overbooked and then accommodated in 1974-75 contributed $99,233,296 to the airline at a rate of $63.65 per passenger. For the year ended June 30, it figured 842,637 passengers were overbooked and accommodated while 16,545 were denied boarding.

Benefit/cost analysis suggested 50 overbooked passengers were boarded for each passenger denied. A 50:1 ratio doesn't look bad from a management point of view unless there is something with which to compare it.

However, this ratio only authorizes the practice of overbooking; it does not suggest there is no way of further minimizing the problem of denied boardings. That requires a whole different study.

The denied boarding figures currently get little analysis that I know of, but what exists is not as comfortable as the 50:1 management overview. United, for example, was unable to get more than about one third of the denied passengers to their destinations with less than a two-hour delay (the current success/failure criterion of the airlines).

United said the "space planning program is continually being refined." However, a "failure" ratio of two out of three suggests denied bookings are occurring on flights when there are long delays (perhaps overnight) before alternatives and/or denied bookings are occurring on flights where there is strong demand.

In fact, while the practice of overbooking may well be justified by 50:1 figures, the separate problem of the 2:3 failure ratio when denied boarding occurs has simply not been addressed by the current spate of public information articles. Until it is, there is little that professionals can do other than speculate.

But we can speculate; and that may bring forth some better understanding of the problem and how it should be studied. So that is what I am inviting you to do – to speculate on how to study the denied boarding problem.

The accompanying questionnaire serves as a possible starting point and raises a few areas of fairly obvious concern. However, if you have other concerns, then this is where to raise them; they may be the key to a new way of thinking about denied bookings and other DP problems.

The Denied Space Problem

The denied space problem occurs when an airline can't seat a passenger after giving him confirmed seating because the overbooking algorithms overestimated the number of people who would either cancel before flight time or not show at flight time.

Currently, the algorithms are not published, but reportedly include travel patterns by day of week, season of year, routing of flight, past no-show experience and equipment being operated.

The past no-show data is a historical composite of reservation cancellations, no-shows and multiple reservations of flights and in markets of the same type.

(1) What other important factors can you see? ____________

(2) What problems and potential misuses can you imagine in using travel pattern data of the type detailed above? ____________

(3) What type of information about the overbooking algorithms would assist you in suggesting possible improvements for consideration by the airlines? ____________

(4) Other comments ____________

Name ____________ Position ____________

Address ____________

City/State/Zip ____________

After completion, please return to Alan Taylor, c/o Computerworld, 797 *Washington St., Newton, Mass. 02160.*

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Productivity Management—Part 2

Naming Goals, Finding Staff Precedes Design Work

In the first half of this series [CW, Dec. 13], spokesmen for Keone Associotes outlined the problems they encountered when they first tried to handle large-scole, fixed-cost softwore development projects. This orticle provides more details on their "productivity monogement" methodology, the opproach they devised to counter those problems.

Special to Computerworld

BOSTON — The term "define the job" suggests the technical dimensions of a job to be accomplished. But in the parlance of Keane Associates, Inc.'s productivity management technique, it means much more.

It means defining the business and personal relationships within the task and facing up in detail — at the very start — to the expectations that each involved group has.

"Without the painful process of culling, quantifying, listing in layman's language and obtaining assent to the exact results of the effort, the project becomes like a football game in which no one knows the length of the field, the number of downs or what constitutes a penalty," Keane's Francis A. Frank stated.

"Without detailed attention to such 'unimportant' factors as who, in a conflict situation, will have ultimate decision-making authority, the system will bog down almost from the start from vested interests, misunderstandings and confusion," he said.

In a major contract involving a state government, a computer supplier and nine separate state agencies, the lack of job definition and an understanding by each party of what the job was intended to do in detail brought a multimillion dollar project to a virtual standstill.

Within 60 days, Keane personnel applied its detailed "define the job" principles to the project, and it proceeded smoothly from that point to completion on the original schedule — despite a four-month initial delay.

Every systems project manager will say: "Get me the right people, and the job will get done." But, according to the Keane methodology, no one ever gets the right people. More likely, the project will be done with the people on hand.

This is the right way to proceed, according to John F. Keane, the firm's president. Rather than getting the "right people," it is much easier and far more productive to "involve people rightly."

The management task then, is to assure the people on hand will be given a reasonable opportunity to succeed with their individual parts of the project. Since every major development involves at least 14 levels of jobs or functional titles and often hundreds of individuals, each of these must be made specifically aware of their role in the program and consent to it prior to initiation, Keane said.

To achieve this, he recommends massive simplification of each element of the project down to the individual's level. Since unsophisticated non-DP personnel, such as user departments or data entry staffs, are involved, all work descriptions must be prepared in layman's language and presented pictorially in easy-to-understand schedules or layouts.

By applying the well-defined skills of any systems designer — but at a detailed step-by-step procedural level — the problems of

(Continued on Page 14)

ICCP Seeks Questions for New Test

CHICAGO — The Institute for Certification of Computer Professionals (ICCP) has issued a call to "all segments of the DP community" for help in shaping an examination for senior programmers to be given for the first time late next October.

The examination "is aimed at identifying competence rather than excellence. It is not an elitist sort of thing," according to Dr. William Cotterman, who heads the ICCP committee charged with developing the new test.

Chairman of the Information Systems Department at Georgia State University, Cotterman said the examination will include content common to all senior programmers as well as specialized content appropriate for business, scientific and systems programmers respectively.

The new test complements the Certificate in Data Processing (CDP) examination which ICCP has sponsored for several years for DP managers, Cotterman noted. Although the announcement of the programmers' test said it will "round out" the ICCP's certification activities, "some sort of test" for systems analysts is still "being talked about," the professor said.

The broad outline for the programmers' test is "pretty well fixed" for the 1977 sitting, but suggestions and actual questions for possible inclusion in the examination are wanted as soon as possible, he said.

Among the areas to be included are data and file organization, principles and techniques of programming, programming languages and interaction with hardware and software.

'More Than Programming'

But "more than programming techniques" will be covered, Cotterman said, noting "interaction with people" and "those sorts of things a programmer has to know about his environment to be effective" will also be included.

"Environmental" questions, perhaps more than pure applications knowledge, will be the focus of the portion of the examination geared to either business, scientific or systems programmers.

All business programmers should know something, for example, about accounting. And the scientific programmer has to know things about his work — numerical methods, for instance — that a business-oriented worker "will never have to know," the professor said.

The plea for help "as soon as possible" is meant very seriously, he added. The committee's first item review is scheduled for Jan. 20, with others slated for February and March.

Anything received after that won't be considered until a second sitting for the exam has been planned, according to Cotterman.

The ICCP is at 35 East Wacker Drive, Chicago, Ill. 60601, but ideas and suggested questions for the new test should be sent to ICCP Programmers' Examination, 304 E. 45 St., New York, N.Y. 10017.

Applications Accepted

The use of application packages from software houses and other outside sources has become a way of life in many — although certainly not all — installations. The "not-invented-here" syndrome seems to be dying.

But what's involved in the selection process and how well does the implementation go once a package has been picked? How good is vendor support and how does actual experience with a package compare with a user's expectations?

Are the horror stories of years ago still being repeated, or have both vendor and user matured enough to make the packages work?

These are some of the questions to be considered in a special *Computerworld* report on application packages in February. User comments and articles are welcome.

Contributions should be limited to 1,000 words, typed (double-spaced, please) and sent by Wednesday, Jan. 26 to Don Leavitt, *Computerworld*, 797 Washington St., Newton, Mass. 02160.

Output of 'CICS Dump Analyzer' Identifies On-Line Coding Ills

NEW YORK — Installations using IBM's Customer Information Control System (CICS) software may have an easier time diagnosing and, ultimately, solving program problems with the CICS Dump Analyzer package now available from Commercial Software, Inc.

Analyzer is said to take over the time-consuming but necessary interpretation of "raw" dump data and turn it into easily understood information more quickly than programmers could do if they attacked the problem manually.

Hexadecimal calculations, address chain searches and bit mask interpretations are among the tasks handled by the package, Commercial said. The system validates all system address pointers and all system queues and chains, a spokesman added.

Analyzer also interprets control blocks, reporting them to the user in both "Dsect" symbolics and their English descriptions.

It also reports all system-maintained statistics and interprets system bit masks in English, the company noted.

Perhaps more importantly, the CICS Dump Analyzer identifies the control program in which an Abend has occurred; it collects and prints together all control structures related to a given task, even though the data was originally dispersed, according to the spokesman.

The diagnostic software also provides sorted trace tables by task as well as English language "interpretations" of what entries on those tables mean. This includes notation of what command was issued, at what point and for what purpose, he said.

In addition to supporting the experienced programmer in resolving problems, the CICS Dump Analyzer may also serve as a training tool for novices. It would show the trainee a standard way to diagnose current problems and, hopefully, avoid a repetition of the coding errors in future work, Commercial explained.

The "standard" CICS Dump Analyzer — for DOS and OS shops — costs $165/mo while a VS version — for DOS/VS and OS/VS — is available for $175/mo, the vendor said from 420 Lexington Ave., New York, N.Y. 10017.

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'Daft' Links Datapoint, Honeywell Units

SAN FRANCISCO — The Dispersed Automated File Transfer (Daft) package from The Data Stream Is said to support the use of a Datapoint 5500 as the hub of its own data entry network and as a link between its substations and a Honeywell 6000 or Series 60/66 mainframe.

In effect, Daft mates the capabilities of Datapoint's Datashare environment and Honeywell's Gcos, The Data stream said.

Datashare supports up to 16 CRT-basd key stations, each of which can run a separate task under intelligent editing. Daft, on the other hand, allows one or all of the CRTs to sign on to the Honeywell system to utilize its capabilities at speeds up to 4,800 bit/sec, a spokesman claimed.

Honeywell-based operations permitted under this arrangement include remote job entry, remote batch and on-line transaction work under TSS, he noted.

Daft also supports the automatic transfer of specified files between the Datapoint and Honeywell systems. With this capability, operations on a given file can be performed in the most effective environment and the result will be available in both, he continued.

Print Spooling

Data compression, record blocking, restart capabilities and automatic job spawn and output retrieval are features of Daft. Print spooling using Honeywell's line printer and slew control is also performed with the package, he said.

A communications monitor maintains an internal log of all functions desired, along with record counts verified by the Honeywell job-accounting system. Daft operates under any version of Honeywell's Gcos and any version of Datapoint's disk operating system, The Data Stream added.

The Daft package, including several Honeywell resident modules, is available for $14,500 from the vendor at 950 Battery St., San Francisco, Calif. 94111.

Non-DPers Get Output With 'Superenglish'

ENGLEWOOD, Colo. — Non-DP-oriented personnel have now been offered yet another generalized criteria selection and report generating system. This one, called Superenglish, is available from Automated Quill, Inc. (AQI) and runs on Data General equipment.

Like a number of products already on the market, Superenglish accepts user-defined control parameters, searches a file for the desired records, selects them and sorts them into any required order and prints data from them according to user instructions.

Calculations listed by the user can be performed on file data elements either at selection time or as the report is being generated. Data elements to be used can be defined by the user or retrieved from existing files, AQI said.

Can Be Stored

Although designed especially to support the creation of one-time reports, Superenglish includes a facility for storing selection criteria, sort parameters and report formats to ease the creation of often used printouts, a spokesman noted.

The software system has been implemented to function in standalone mode with any Data General file or in conjunction with AQI's Mini-Miz, which is described as a "high performance on-line bookkeeping and accounting system" including a number of specific application modules.

Superenglish is available for a one-time license fee of $4,900; current Mini-Miz users may obtain a license for $1,900, AQI said from 3501 South Corona St., Englewood, Colo. 80110.

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HP CPUs Run in Dual Mode

LONG BEACH, Calif. — Sites running Hewlett-Packard Co. (HP) 2100 or 21MX systems under DOS-M or DOS-III can create dual-processor environments allowing up to four disk drives on each processor to be fully accessible to either at all times, according to Data Systems for Industry (DSI).

An addition to the HP operating systems, developed by DSI for manufacturing systems but now generalized for more universal application, supports the dual-processor access of either HP 7900 or 7905 drives, the independent said.

Contention problems normally arising in dual configurations are eliminated by exchanges of timing and control information between the two systems.

The DSI software costs $4,750 and is available now on magnetic tape from DSI at 3450 E. Spring St., Long Beach, Calif. 90806.

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Goals, Staff, Then Design Work Seen as More Productive Order

(Continued from Page 12)

assembling, motivating, directing and encouraging success among a project team are greatly alleviated.

The third step — estimating time and cost — comes after the job has been defined and the full team assembled and directed, "Is it realistic," John Keane asked, "to expect that a major systems project can be costed and estimated before these two steps are completed?"

Yet, he indicated, an enormous number of software projects do just that, making true control difficult right from the start.

Keane advocates fixing only those time and cost elements that can be fixed and avoiding "premature precision" on those that must rely on "best guess" accuracy.

By being prematurely precise, the manager converts what should be two of his most effective management tools — time and dollar resources — into his worst problems. And it makes introduction of the newest innovations or improved designs almost impossible without cost-time risk during the project's life.

Approximately 75% of any system development effort can be firmly costed; the remaining 25% will involve either design changes or failure-to-comply issues for which budgeting should not be fixed.

In addition, a special "overage" funds/staffing pool should be factored into each project to allow for both desirable and necessary changes of scope during the project's life.

The 80-Hour Rule

Probably the core precept of ongoing control within productivity management is the fourth principle: the approach Keane calls the "80-Hour Rule."

In essence, the rule states that no single task in a project can take longer than 80 hours — or two man-weeks — from start to finish. In other words, a total systems project, regardless of its size or complexity, must be broken down into work units that can begin and end within 80 hours.

This rule assures four fundamental management tools are always operable. The first is measurement — either a task is finished or it's not in a two-week span. The second is motivation; by meeting two-week targets repeatedly, team members learn to win and succeed.

The third tool is problem isolation; if the two-week finish isn't met, identification of the nature and reason for the problem can be made immediately. The fourth is accountability; each team member knows what he must do, the time frame in which it must be done and the relationship of his performance to the progress of the total project.

Changing Project's Scope

Most systems managers would consider encouraging the change of a project's scope a disastrous concept. But productivity management recognizes two truisms: first, that a major project can never be implemented within a rigid, unchanging structure; and second, that many excellent and innovative changes are bound to be suggested as team members get deeper into project implementation.

Thus, a system for identifying proposed changes of scope, for reviewing such changes and for measuring in advance their potential impact, both good and bad, becomes as much a part of the development task as systems design or functional specifications. It is integral to the success of the project.

The final precept of productivity management is to establish criteria for acceptance of the system. Traditionally, this is often done after the time and dollars for the project have been expended.

"That's a little like jumping off a cliff to get to the bottom, rather than carving a series of steps that lets you get there a stage at a time," Frank explained.

Keane's approach is to use a series of "Authorizations to Proceed" — formal documents on which all appropriate personnel must sign off before the next step can be taken. Without such written authorizations, implementors proceed at their own risk.

Thus, carefully staged series of authorizations, based upon measurable progress which is easy for all to understand and accept, assures that, when it is time to accept the finished system, management and user departments are in effect accepting only the final 4% to 5% of the effort, rather than 100%.

And problems that might occur become minimal, rather than massive, "because acceptance has taken place in a continuum since the project's start."

Beyond these six operating principles, productivity management represents a total environmental evolution, a way of thinking about, planning for and managing major intricate systems projects — even those that do not involve computers.

"We see it as an effort to deal with the newest frontiers of modern organization — the need to achieve goals while fulfilling the expectations of all of the individuals who participate in the process of attaining and who enjoy the benefits of using modern organizational capabilities," John F. Keane said in summing up.

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COMMUNICATIONS

In Intracompany Transmissions

Combined Services Seen Key to Cost-Effective Future

By Ronald A. Frank
Of the CW Staff

HILTON HEAD, S.C. — Communications services will be cost-effective to users if they combine voice, data and graphics capabilities — at least as far as intracompany needs are concerned. This opinion was voiced by Archie J. McGill, director of marketing management at AT&T, and John M. Galvin, executive vice-president at Aetna Life & Casualty Co.

The two speakers took part in a discussion of new communications facilities at a conference sponsored by International Data Corp. on distributed DP here recently. Galvin described implementation plans for Satellite Business Systems (SBS) in which Aetna is a partner with IBM and Comsat General Corp.

Predicting SBS will be ready to install its first earth station at a user site in late 1979 or in 1980, Galvin said earth stations are now projected to cost in the "low hundred thousand dollar" range; the cost will be borne by SBS, he added.

Users will be charged on the amount of data being transmitted and the sites connected to the satellite network, he said.

Initially the SBS service will be limited to intracompany applications. Intercompany usage will be added later depending on regulatory and other constraints, Galvin said.

The SBS service will handle users with both voice and data needs with an integrated type of offering which might include all-digital image processing as well, he said.

McGill, speaking for AT&T, did not talk in terms of specific services, but agreed the information systems manager of tomorrow will be looking for a "systems approach to information handling with all information regarded as a corporate resource." This would include integrating voice, data and image communications, he said.

The trade-off on centralized vs. decentralized processing can no longer be tied to the way in which data is handled since information can now be "manipulated at the source, centrally or both," McGill told conference attendees.

The communications vendor can no longer be part of the problem — instead, it has to be part of the solution, offering users a total systems-oriented service, he said.

Galvin

McGill

CW Photos by R. Frank
Roberts

Much of the processing which is being distributed is designed to facilitate communications. It is this communications processing that may reside at various points in the system architecture including centralized hosts, communication nodes or other points, he said.

Representing the packet-switched approach was Lawrence G. Roberts, president of Telenet Communications Corp., who said some users of his firm's network now connect up to five CPUs, each operating with its own software.

If international connections are made among packet-switched nets as proposed, international resource sharing will become possible, he said.

One problem with such interconnections is that some countries do not want to handle third-party traffic bound from one country to another. This may require common interconnections among all countries in a network, he said.

Current costs for the 100 users' hosts on Telenet are about $2.75/hour when all speeds are averaged. This is about 1 cent to send a page of copy compared with about 12 cents to send a page by facsimile transmission, he said.

Efforts now under way to standardize the X.25 protocol will mean otherwise noncompatible terminals will interface with packet nets. One of the benefits of this standard is that it will allow multiple access to multiple CPUs, he said.

Presenting the Federal Communications Commission (FCC) point of view was Dale N. Hatfield, chief of the commission's Office of Plans and Policy, who reviewed current issues now pending before his agency.

(Continued on Page 16)

Lessor Has Network Management System

HARTSDALE, N.Y. — DPF, Inc. has introduced an integrated hardware/software network management system designed to reduce CPU overhead by providing multilevel telecommunications functions for users with on-site IBM CPUs.

Flexicom is composed of an additional IBM 360 or 370 CPU and a recently updated subset of Task/Master II telecommunications monitor software from Turnkey Systems, Inc.

Task/Master is tuned to front-end and remote processing functions, according to a DPF spokesman.

The Flexicom hardware/software package handles network statistics, polling, message queuing and routing and resource management functions, he said. It can also be configured to handle some applications processing offloaded from a user's present CPU, which acts as a host to the Flexicom system.

Working as a front-end processor, Flexicom can communicate with the host at channel speeds with the addition of a channel-to-channel adapter, the spokesman noted.

The basic system consists of and is based on an IBM 360/30. In the front-end processor mode, Flexicom is placed between the user's CPU and an IBM 3705- or 270X-type transmission control unit (TCU).

As a simplex distributed processor, Flexicom provides more local processing capability, the third-party lessor said. The package is linked to the host CPU via telephone lines from a remote location, the spokesman added.

In local mode, Flexicom could allow a regional DP center to run local applications, switch messages and communicate to the host only on a demand basis, DPF noted.

As a multinode distributed processor, the package exists as a communications processor at not only the host site, but also at remote sites connected to the master site via telephone lines, the company added.

Flexicom also includes automatic restart and error recovery to resume processing after a system failure; it can reportedly provide support for about 40 different types of terminals of unlimited number.

The package is compatible with IBM hardware and software and therefore requires minimal programming for integration into the user's environment, DPF said.

In addition, application programs can be written at each level of the network in the higher level languages, DPF claimed.

The leasing company is offering versions of the package based on 360 or 370 mainframes depending on user processing requirements. The options available include IBM or IBM-compatible hardware including the TCU; I/O set and peripherals such as printers or card readers, according to the spokesman.

Maintenance could be provided by IBM, vendors of the IBM-compatible products utilized or by a third-party maintenance firm, he said.

A basic Flexicom based on a 256K IBM 360/30 with 30M bytes of disk storage, software support, installation and maintenance costs $6,000/mo on a five-year lease.

The same system could be purchased for less than $250,000, according to the spokesman, who added there is a wide range of system possibilities and costs.

DPF is located at 141 Central Park Ave. South, Hartsdale, N.Y. 10530.

Corrections

The New York City Police Department's terminal network [CW, Dec. 13] accesses the New York State Police Inquiry Network CPU supporting AT&T Dataspeed 40 terminals through one 2,400 bit/sec dedicated CPU-to-CPU link. And the Action Communications Systems, Inc. telecontroller acts as a front end for the department's dual IBM 370/158s.

The correct address of Trivex, Inc. [CW, Nov. 22] is 3180 Red Hill Ave., Costa Mesa, Calif. 92626.

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Vendor Cooperation Saving $10,000/Mo for Net User

By John P. Hebert
Of the CW Staff

NEW YORK — A large Japanese trading firm is saving $10,000/mo in computer usage charges and has upgraded the transmission capabilities of its international link through international carriers' efforts and a dedicated communications facility.

For three to four years, Marubeni Corp. paid ITT World Communications, Inc. here about $15,000/mo in usage charges alone to handle the major node in its computerized message-switching system, according to a user spokesman.

Marubeni used ITT's shared-user Automatic Message Exchange switching system to handle merchandise trading information coming from 54 terminals in Tokyo over as many 75 bit/sec circuits costing $275 each in ITT computer termination usage charges, he said.

Dissatisfied with that method and burdened by a substantial growth in message traffic which is expected to double by 1981, Marubeni sought the advice of both ITT and Kokusai Denshin Denwa (KDD), Japan's international communications carrier. It wanted to help reduce costs and speed thousands of messages that funnel daily through the firm's 20 domestic and 175 overseas offices and subsidiaries.

The two international carriers got together and developed a common protocol which would allow their centers to communicate with equipment of different design and speed.

Based on Dual Minis

The Message Link Control protocol was implemented in a Digital Equipment Corp. system on Incotel Ltd. proprietary software. Incotel provided ITT with the DEC system on a turnkey basis, according to Marty Weisbart, the ITT engineer responsible for the Marubeni project.

The trading firm purchased dual DEC PDP-11/40 CPUs from ITT. The system was outfitted with DEC RK05 disks, a DEC DU11 medium-speed synchronous line interface, a DEC DC08 low-speed interface, a line printer, paper tape reader/punch and NCR Teletype-compatible, 150 bit/sec supervisory terminals to monitor and route traffic.

The dual CPUs allow trading information to flow between the Tokyo center's "roomful" of Teletype Model 40 CRTs and New York at 2,400 bit/sec speeds, Weisbart said.

ITT's Transpac II ground cable is the transmission medium across the Pacific to San Francisco. Another cable between the West Coast and New York brings an estimated 6,600 messages each day to and from the ITT center here in biplexed 2,400 bit/sec streams, Weisbart said.

Codex Corp. 4,800 bit/sec modems handle the biplexed data streams for input through the DU11 interface to the PDP-11/40s.

The DEC minis can store up to 10,000 messages of varying lengths up to 10,000 characters and send them out through the DC08 interface to 31 lines serving Marubeni teletypewriter terminals in the Western hemisphere operating at different speeds up to 75 bit/sec, according to Weisbart.

And a Spectron Corp. Datascope CRT was an "invaluable help" in establishing the medium-speed link because of its line diagnosis functions.

Marubeni's third center in Brussels, presently maintained by ITT/World, will be upgraded to replace 16 or 18 of the typical 75 bit/sec international lines with one line carrying data at the 2,400 bit/sec speed, Weisbart said.

The Eurotech subsidiary of Cable and Wireless Ltd. will take over operation of the Brussels center early next year to complete Marubeni's Benimex II worldwide message exchange system network, he added.

Because of lower traffic to points in Europe, however, the Brussels center will not have the same modern equipment as its New York and Tokyo counterparts and will not receive message transmissions directly from Tokyo.

Rather, data will be transmitted through the established Tokyo-to-New York link, even for messages originating in New York, Weisbart said.

Portable Analyzer Tests Nets, Equipment

STAMFORD, Conn. — The DA-404 portable data analyzer from the Stelma Telecommunications subsidiary of Dataproducts Corp. is a battery or ac-operated test set for troubleshooting communications networks and equipment.

Used in conjunction with a test pattern generator, the data analyzer reportedly gives a field technician the capability to install, troubleshoot and test data or telegraph systems.

The analyzer measures and indicates the type and magnitude of distortion present in asynchronous data and telegraph signals, Dataproducts said. It also detects the presence of parity errors in IBM 7-level or Ascii 8-level signals, a spokesman added.

The DA-404 has LED display; while indicating end or bias distortion, it simultaneously indicates the total peak distortion present in the signal, he said.

The unit provides any of four user-specified bit rates from 37.5- to 1,200 bit/sec.

The DA-404 costs about $690. A portable pattern generator, the PG-404, is available for use with the DA-404 and is also priced at about $690, Dataproducts said from 17 Amelia Place, Stamford, Conn. 06902.

Combined Services Seen Future Key

(Continued from Page 15)

Commenting on the Consumer Communications Reform Act, Hatfield said it would result in the dependency of American consumers "upon the discretion of a sole-source monopolist for the availability, diversity and quality of their communications services."

In its wording on jurisdiction over terminal equipment, Hatfield said that the bill could be interpreted as applying to mainframes.

It would be difficult if not virtually impossible to establish a nationwide network using specialized terminal equipment under provisions outlined in the bill, Hatfield said.

Addressing the argument from the telephone industry that competition will lead to increased rates for residential users, Hatfield said a recent economic study by the FCC staff had shown "the opposite may be the case."

Even if the argument is correct, however, there are "adequate remedies available" to maintain current residential rate levels and also have competition, he said.

Local-Loop Data Sets Run at 9,600 Bit/Sec

ESCONDIDO, Calif. — Designed Enclosures, Inc. (DEI) has introduced local-loop asynchronous data sets capable of 9,600 bit/sec operation.

The Asynchronous Data Transceiver (ADT) Models I and II are suited for low-, medium- and high-speed asynchronous data distribution over local loop metallic cable pairs, DEI said.

The data sets can operate at distances up to 20 miles and include internal diagnostics, loopback test functions and transmission line protection, according to the firm.

Prices for the ADT I and II start at $175, DEI said from 563 N. Citracado Parkway, Escondido, Calif. 92025.

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Bits & Pieces

Memorex, Graham Hike Prices of Magnetic Tape

Two suppliers of magnetic tape have increased their prices.

Memorex Corp. raised prices by 15% on its standard line of 600-, 1,200- and 2,400-ft computer tapes.

The hike, effective Jan.1, reflects the increased cost of materials used in the production of the tape, a spokesman for the Santa Clara, Calif., vendor said.

Graham has hiked prices 10% to 16%, a spokesman said from Graham, Texas 76046.

Tektronix 4051 Users Organize

BERKELEY, Calif. — An independent group of Tektronix 4051 graphics systems users has been formed to "provide an active forum where users can exchange information relative to the entire spectrum of the 4051 computing environment," according to a spokesman.

The group intends to establish a software and hardware information exchange as well as committees devoted to applications development, vendor liaison and professional recognition, he added.

Information is available from Vic Kley, P.O. Box 2117, Berkeley, Calif. 94702.

Bar Code Printer Offered

MOUNTLAKE TERRACE, Wash. — A two-hammer bar code printer that is said to print an alphanumeric bar code plus an independent line of descriptive text is available from Interface Mechanisms.

With the Model 8130 printer, a human- and machine-readable bar code label or tag is available at the point of use, a spokesman added.

Designed to fulfill the data-handling requirements of industrial inventory control, libraries and hospitals, the Model 8130 prints on a continuous roll self-adhesive paper labels or perforated tags. It uses a dry carbon ribbon to produce bar codes "with high optical contrast and sharply defined edges," the company said.

The printer has a typewriter-style, full alphanumeric keyboard. Suitable for random, batch or sequential label runs, the serial impact printer uses Ascii I/O.

The Model 8130 with keyboard and display costs $7,487. Interface Mechanisms is at 5503 232nd St. S.W., Mountlake Terrace, Wash. 98043.

Printer Line Counter Bows

CLEVELAND — Computer Resources, Inc. (CRI) has a computer printer line counter for use in ribbon management programs.

The counter features a presettable function which alerts the user when the printer reaches any user-determined level without causing the counter to lose the job count, CRI said.

The line counter costs $279 from CRI at 4650 W.160 St., Cleveland, Ohio 44135.

Xerox Cuts Printer Sale Price

EL SEGUNDO, Calif. — The purchase price of the Xerox 1200 Model 1 printing system has been reduced from $145,000 to $125,000 and new rental pricing plans and use charges for the system in the U.S. were announced by the company.

The effect of the new rental and use prices will be to increase charges for many customers approximately 5% to 9% and to lower charges up to 11% for customers with high work volume who rent two or more units, according to a spokesman.

The price changes were effective Dec.1 for new business. Effective dates for current customers will depend on the renewal dates of their agreements, he added.

Saving $2.5 Million/Year

System Brings 'Miracle' to Maryland

The Maryland Motor Vehicle Administration processes more than 7,500 record changes each day on its two systems.

GLEN BURNIE, Md. — Computerization of the Motor Vehicle Administration (MVA) here has allowed the State of Maryland to save an estimated $2.5 million annually, according to Ejner J. Johnson, MVA administrator.

The MVA uses Control Data Corp. mainframes to keep track of over two million licensed drivers and two million more registered vehicles in the state.

The administration is in on-line contact with its 13 divisions while maintaining communications with various state and local law enforcement agencies via a software system called Miracle for Management Information Retrieval for Action and Communication With Law Enforcement.

Information on driver licenses, driver records, vehicle registration and tags, ticket accounting and related departmental data is available through a pair of CDC 3500 systems supplemented by 30 CDC 844 disk storage files.

Data entry and retrieval is mostly key-to-disk, with magnetic tape used primarily for backup and off-line printing jobs, Johnson said. The old batch-oriented system required all transactions to be updated on tape; changes were then siphoned off for subsequent file updates and retrieval purposes.

The old system gave comparatively slow turnaround from input transactions to retrieval; it also required the name and address of a person, corporation or other organization to be listed redundantly in each of several system records, he noted.

Eliminating this redundancy is a highlight of the Miracle system, Johnson said. It is based on "marrying" files so all information pertaining to an individual for driver licenses, history, vehicles and various departmental actions is available from one name and address record file.

Under the old system, an individual with a driver's license who owned three vehicles appeared four times in the tape and memory files and his name and address was repeated in each. The Miracle system contains this person's name and address only once and all information pertaining to him is cross-referenced to the single name and address entry.

The use of a soundex identifier for coding driver license information has aided the implementation of this file marriage, Johnson said. The soundex formula codes a driver's last, first and middle names with his month and day of birth by means of a 13-digit identifier.

Soundex has a capacity of nearly 18 million separate entries, allowing almost unlimited possibilities for expansion, he added. The last character is flexible to permit separate entries for two persons with identical names and similar birth months and days.

Some idea of the storage saving that results from file marriage is the example of a large Maryland utility with more than 3,000 vehicles registered in the state. Previously, its name had been repeated over 3,000 times in tape and memory files, representing nearly 350,000 characters of memory storage.

Under the Miracle system, a single name and address entry for all vehicles reduces character storage requirements from nearly 350,000 to 100.

Rapid Transmission

"Another advantage of the file marriage," John B. Burke, technical manager, said, "is that it aids rapid transmission of management information and speeds communications."

Installed at MVA headquarters, branch offices throughout the state, law enforcement agencies and the Baltimore District Court, a system of more than 199 CRT and printer terminals permits quick information.

The success of the MVA's computer center operations hinges upon rapid processing of thousands of daily transactions to keep driver and vehicle files continuously up to date. Each year the center produces and processes more than one million driver license renewal applications and issues over one million licenses.

It is also responsible for the issuance of over two million vehicle registrations and produces nearly 800,000 vehicle titles.

The administration has estimated that, based on increases of as much as three times in the volume of its transactions during the past 10 to 15 years and an expectation that this trend will continue, failure to computerize its activities would have required doubling existing MVA facilities and the expenditure of millions of dollars.

CMC Designs Data Entry System For Distributed DP Environment

LOS ANGELES — The XL40 from CMC, a division of Pertec Computer Corp., is a distributed Keyprocessing system said to combine data retrieval, entry and management.

Software for the system allows data to be entered at the source and be validated at the entry point, according to a spokesman.

Data entry and report-writing capabilities are provided via a subset of Ansi Cobol which has been extended to include terms unique to distributed key-entry processing, CMC said.

Hardware for the system includes a microprocessor-based CPU. Up to 128K bytes of MOS random-access memory can be addressed, the spokesman said.

The unit can accommodate up to four tape drives, four disk drives, seven keystations, a card reader and a printer, he added.

The XL40 uses the Cobol Shared Access Method (Cosam) retrieval package which, by using indexed files, allows an operator to retrieve and update a file, CMC noted.

Communications on the XL40 include IBM 2770, 2780, 3780 and Hasp 360/20 workstation protocols.

In addition, the system includes the XL/OS operation system for foreground and background control of processing. Data entry, editing and monitoring of system operations occur in foreground while multiple job streams are processed in background, the company explained.

The system can support up to seven keystations. Users can opt for either keypunch-style or typewriter-style keyboards with numeric pads. Disk capacity is expandable from 4.4M- to 35.2M bytes.

An XL40 with five keypunch-type keyboards and 4.4M bytes of disk leases for $975/mo or can be purchased for $32,200.

CMC is at 12910 Culver Blvd., Los Angeles, Calif. 90066.

DASF Lets IBM 115, 125 Users Increase On-Line Disk Storage

By Esther Surden
Of the CW Staff

WHITE PLAINS, N.Y. — The IBM 370/115-2 and 370/125-2 will soon be able to accommodate up to 1.8G- and 2.3G bytes of on-line disk storage respectively through attachment of 3344 disk drives, according to an IBM spokesman.

Model 115-2 and 125-2 systems can be upgraded in the field by attaching the 9317 Direct Access Storage Facility (DASF).

The DASF for the 115-2 costs $83/mo on the Monthly Availability Charge (MAC) or $2,055 to purchase; it costs $84/mo MAC or $2,055 for the 125-2.

Previously the 115 could accommodate only 560M bytes of on-line storage while the 125 could store 1.12M bytes. The capability effectively triples the amount of on-line storage that can be accommodated by the 115 while doubling that of the 125, the spokesman said.

Units That Attach

The 3344 Models B2 and B2F are two-drive units that attach to a standard 3340 Model 2A. The 3340 connects to the systems direct disk attachment.

Up to three 3344 units can be linked to each 3340 Model AS2, and users may intermix 3340 and 3344 standard and fixed-head models, the spokesman noted.

The 3344 can accommodate about 280M byte/drive.

The 3344 B2 rents for $1,351/mo and costs $49,500 to purchase; the B2F costs $1,774/mo or $65,000. The capability will be available in September.

User Survey—Part 1

Study Highlights Four Areas of Distributed Processing

This is the first article in a two-part series dealing with distributed data entry. This article covers data entry and editing techniques.

By William J. Moore
Special to Computerworld

To supplement our experience in the basic elements of the distributed processing arena, Inforex, Inc., together with an independent consultant, conducted a study of the distributed processing plans and requirements of 50 major computer users throughout the country.

The result of the study was a working hypothesis — a definition of a rapidly developing arena at a particular point in time.

The study drew four major conclusions:

- Every user studied will distribute his DP operations. Many had plans under way.
- Each operator at each remote site would spend as much as 90% of his time entering data.
- Users planned little if any remote batch processing. Instead, they wanted record-by-record processing — the ability to manipulate or verify data as that data is entered.
- Users agreed the service and support any distributed processing equipment vendor is able to provide is a major factor in evaluating vendors. They said support is critical because equipment will often be installed in remote locations and operated by persons without specialized training.

Two Major Concerns

The 50 users studied had two major concerns: the timeliness of data and the validity of data. Those concerns were tied closely to two major expectations: cost reduction and the ability to provide better service to customers.

The users anticipated the cost reductions which come with improved control over any operation. They anticipated that accurate, timely information derived from a distributed system would enable them to respond more quickly and to better allocate production or other corporate resources.

With those concerns and expectations in mind, Inforex defined the distributed processing arena as consisting of four basic elements: data entry, data editing, file management and communications. Each basic element has implications for hardware, software and the human engineering factors which can sometimes be overlooked.

Trend Toward Decentralization

Data entry, like other aspects of DP, is becoming increasingly decentralized. As part of that trend, users have come to expect more data manipulation capabilities, in general, and more data validation capabilities, in particular, from their data entry systems.

Six specific data entry features are important to users who require timely, valid data whether at central or remote sites. These features are cursor control, field definitions, audit logs, error control, easy reset and insert/delete.

Languages

Unfortunately, many distributed processing systems vendors have overlooked these capabilities or have minimized their importance by requiring that each be programmed by users — typically, in the vendor's own language.

Large users certainly have the necessary programming skills, but all six features have been provided in centralized data entry systems and it should not be necessary for users to reinvent the wheel when configuring distributed systems.

Data entry will be facilitated if distributed processing systems are easy to set up; that is, if separate programs are not required each time a user wants to perform a simple application. A set of macroinstructions for use in defining fields, check digits and the like would sharply reduce user programming time.

Use of Remote Terminals

Remote terminals will likely be used in a variety of applications each day. Efficient data entry, therefore, requires easy sign-on and sign-off procedures. Audit logs and other error control features — audible signals and error messages — should be provided as standard data entry features, with no user programming required.

The record and character insert/delete capabilities should also be standard since 90% of each operator's time will be spent on data entry. Even experienced operators can omit data, mistype an entry or omit an entire document.

Features such as character and record insert/delete are necessary, the users indicated, if valid data is to be supplied in a timely manner.

The users also stated distributed processing systems vendors should be responsible for providing packaged data entry functions, but vendors should also aid users' applications programming efforts by providing powerful, industry-standard programming languages. Such languages are widely known and, therefore, easier to maintain at remote locations.

The study indicated an interactive language able to provide both interactive and batch communications is the real requirement.

Awareness of Alternatives

The importance of programming languages reflects a growing awareness among users of the wide range of alternatives available to them. Users with centralized data entry operations, for example, came to expect editing and calculating capabilities as well as entry capabilities a long time ago.

Similarly, users are aware of the capabilities of industry standard languages and should expect to use those capabilities in distributed systems.

And whatever language or set of languages a user selects, he should be able to mix them, keying an application in one language, for example, while using another for some special purpose at the same time.

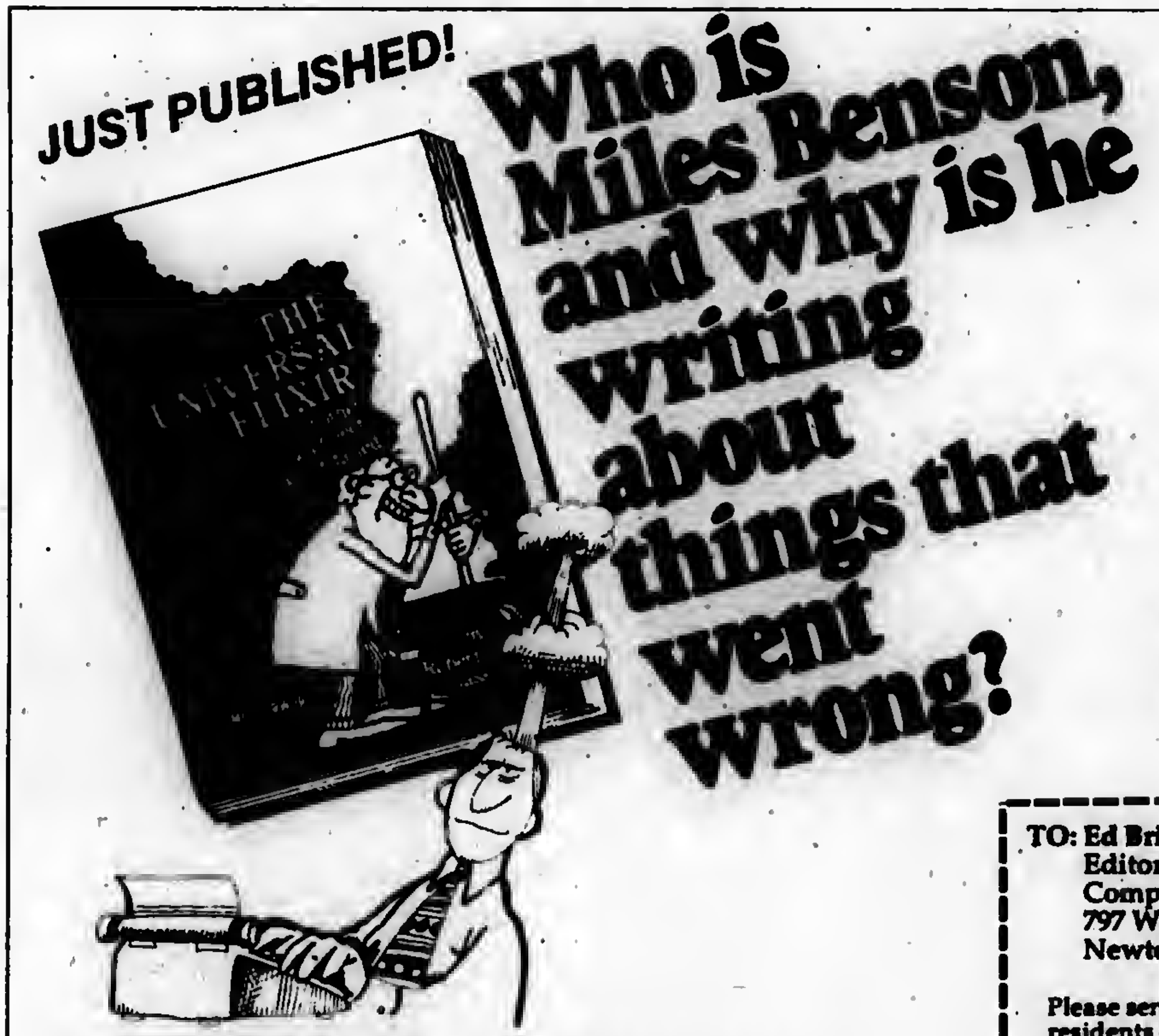
Mixed Capability

That mixing capability presumes two other capabilities: concurrency, or the ability to do a number of different types of jobs at the same time, and multitasking, in which each terminal on the system can be used to perform a different task.

The study confirmed Inforex's experience with user software requirements for distributed systems. Down-line loading is important, for example, because it allows a central site to retain control of a network.

Network passthrough, in which an inquiry made from a remote site is automatically routed through other remote data bases and, ultimately, to a central data base is also important.

Moore is vice-president of domestic operations at Inforex, Inc. in Burlington, Mass.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STORM LAKE, Iowa — While you're gobbling up your holiday meal next weekend, you might think of the Midwest turkey farm here that uses a small system to help make decisions on "when to bring fresh and frozen turkeys to market."

The system is also used for general business applications, according to Steven C. Maxwell, secretary/treasurer for Thompson Industries.

The company is an Integrated turkey firm whose divisions encompass egg production, hatching, commercial turkey production and feed mills.

"Accurate records on the organization's various divisions are a necessity," Maxwell said. The firm's volumes — 3.5 million eggs hatched, two million turkeys raised and 60 million pounds of turkey processed — preclude "use of anything but computers to give management timely information on the business."

The system keeps track of frozen turkey inventories and shipments by customer or type of product, production data, feed inventory, accounts receivable and payable, general ledger transactions, payroll, egg sales and commitments.

"When available on a timely basis, this type of information gives us a competitive edge over others in our industry because of the daily fluctuation of turkey market and commodity prices. It enables us to factor costs and other production data into management decisions," Maxwell said.

The DP operations, which expanded overall data entry and program processing with the $170,000 system, consists of a Honeywell Model 62/40 with 72K bytes of main memory, an additional 23M bytes of disk memory and a 400 line/min printer. Three communications lines interconnect major turkey processing sites here and at Ellsworth, Iowa.

"With flock mortality running anywhere from 5% to 10%, margins low and the turkey market volatile, we've got to think and operate much smarter than the competition," Maxwell said.

"Naturally, Thanksgiving and Christmas are the peak periods for a turkey processor, but we're finding that consumer tastes and packer innovations are giving us year-round markets and products for turkey meat.

"Beef and pork producers are beginning to see our tasty and nutritious substitutes such as turkey ham, hotdogs, jerky and even turkey loaf compete with their traditionally high-fat, high-cholesterol offerings."

A typical turkey flock of up to 10,000 hens and toms will be hatched on the same day and grow to maturity together. From the time a flock is placed as day-old chicks in the brooder house until it is processed, each flock generates a data file which tracks the 16- to 22-week economic and natural history of the birds.

During the life of the flock, mortality counts are taken every two weeks; feed consumption with as many as 20 ingredients per feed mix is recorded; medication, fuel, labor and other overhead factors are assigned and tallied against the flock.

When birds are marketed, the weight and sale price is compared with these cost factors to determine profit or loss on each flock and feed conversion per hen and tom.

"The system then compares market results with data generated by other flocks according to season, whether the turkeys were raised inside or out, sex and mortality causes to provide an accurate profile of success factors," Maxwell said. "When added to the weekly data runs, this type of information gives us one of the most extensive and sophisticated flock-reporting systems in the country; it certainly gives us a distinct advantage over our competition."

At Thompson Industries, the manager responsible for the information gathers the data and inputs it directly into the system.

"Market acceptance of new turkey meat products and internal growth projections to meet demand, as well as volatile pricing, requires accurate cost controls before bringing these birds to market," Maxwell noted. "Most important, management can now react in a timely fashion to affect the result rather than in response to the result.

"Each improvement, now that we have the basic capabilities, will give us better information on our turkey inventories, whether they are inventories reflected in live birds or processed inventory," Maxwell said.

Future system growth calls for increased communications between the headquarters and farms, processing at profit centers through remote job entry minicomputers linked directly to the host, expanded on-line terminals and more memory.

$1 Million Dispatch System

Taxi Fleet's Mini Helps Speed Vehicles to Passengers

By Esther Surden
Of the CW Staff

OTTAWA — Need a taxi? Hate to wait?

Computers are taking over at the Blue Line Taxi Service here to help speed vehicles to waiting passengers and passengers to their destinations.

Designed and installed by Digital Methods Ltd., the $1 million dispatch system uses minicomputers from Data General (DG) Canada Ltd. and terminals from Moscan International in New York, according to Wayne M. French, general manager.

"We've been working on the idea for four years," French noted.

System Selects Taxi

When a prospective passenger telephones the taxi company, a call taker types the name and location into a CRT located in the central office. The computer selects a taxi and matches it up with the call.

The taxi gets a reading on a small CRT and the driver can reply to the message if necessary.

"He has 10 seconds to take the call," French said. If the call is not taken, that cab goes to the back of the line it that area and is not called again until his cab comes up to the top of the queue.

"We have the city divided into 23 areas," French explained, "so the cabs can book into whatever area they happen to be in; they do all this booking in from their in-car terminal."

Each terminal has separate identification. When the identification number is punched in, the computer knows which car is calling and books the car into that area.

Blue Line has computerized 100 of its 500 taxis so far and is pleased with the results of the program. The system has been installed since June.

About "95% of the 300,000 population is repeat business," according to Donald Montgomery, the company's owner and

(Continued on Page 22)

Modcomp Turnkeys Designed for Commercial DP

LEXINGTON, Mass. — Two turnkey small business systems designed for commercial DP applications have been announced by Modcomp Business Systems.

Based on the Modcomp II 16-bit minicomputer from its parent company, Modular Computer Systems, Inc., Modcomp Business Systems' turnkeys perform applications such as sales order entry, general ledger, accounts receivable and payable, inventory and payroll, according to a spokesman.

A basic Model 204 includes 64K of user-available core, two CRTs, a 10M-byte disk and a 165 char./sec printer. It can be expanded to four terminals and is field-upgradable to the larger Model 232, the spokesman indicated.

The Model 232 has 128K bytes of core, five CRTs, two 24.6M-byte moving-head disks, a 600 line/min printer and an operator console. It can be expanded to 32 or more terminals, Modcomp said.

Modcomp Model 232

The business systems operate under Modcomp's MAX III operating system with commercial extensions, the DBMS 200 data base management system and teleprocessing monitor software.

The larger 232 uses the Modcomp 1900 series communications subsystem with an asynchronous communications multiplexer that can support up to four multiplexers. Each of the four multiplexers can support 16 communications channels, the firm said.

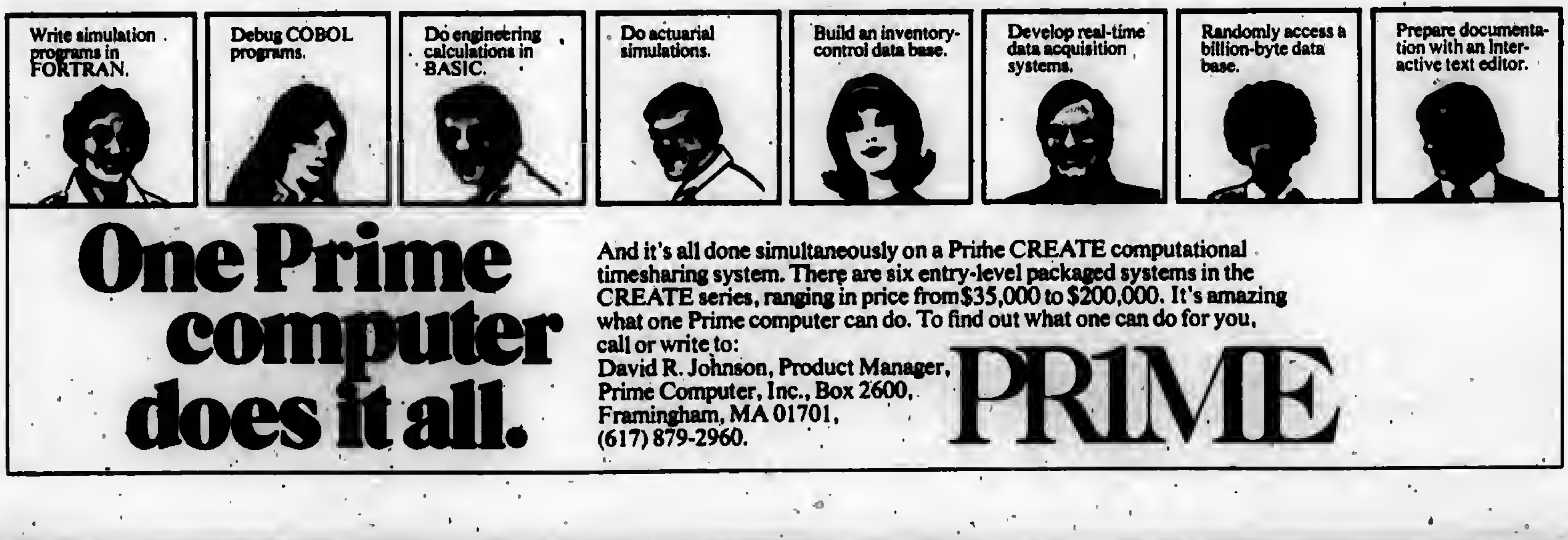
With the systems, Modcomp Business Systems announced a software package called Industry Management System (IMS) 201 for handling management system applications for industrial distributors.

The package, which can be used on both the 204 and 232, handles sales order entry, customer billing, inventory management, accounts receivable, sales analysis, sales commission calculations and purchase order control.

A detailed audit trail is maintained by the system to provide accounting continuity, the firm said.

The basic Model 204 costs $54,600; the Model 232 costs $96,050. The IMS 201 software costs $9,000.

Modcomp Business Systems is at 21 Worthen Road, Lexington, Mass. 02173.



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PRIME

First User of Syfa Linking Remote Depot, Central Site

MANCHESTER, England — The first user of the Computer Automation, Inc. Syfa system is connecting a remote depot with a central site for on-line applications.

Wright & Green, a grocery distribution and retail organization, will use the distributed system to provide its branches with on-line sales, inventory and financial controls operations.

The firm selected the system on the basis of cost, response time and the need to service all its distribution points, according to a spokesman.

The firm also wanted a system that could be upgraded easily, he added.

Prior to installation of the Syfa, the firm used a batch processing system connected on-line to a computer service bureau. The smaller supply depot was not receiving the same quality of service as the larger depot.

The Wright & Green Syfa system includes a CPU with a 64K memory, two 80M-byte disk drives, eight Syfa information station terminals, two high-speed line printers and one character printer. The remote depot uses two of the information stations and the character printer to access the central system's services.

The system cost is about $135,000, the spokesman said.

The processor and remote terminals are linked by 4,800 bit/sec telephone lines via modem/multiplexers. So far, on-line applications include invoicing, sales ledger processing and general warehousing packing lists.

The system will ultimately handle five broad functions — sales order processing, financial accounting, stock accounting, management accounting and retail operation, according to the spokesman.

In sales processing, Wright & Green anticipates the distributed system will significantly cut the cost of listing and processing daily and weekly order lists, changes and availability of grocery items, he said.

Several accounting operations will be augmented by a set of programs, including sales and purchase ledgers, cost/profit ledgers for management and bank reconciliation for each operating center.

Grocery stocks will be produced as a daily list, which include price changes and profit margins, plus turnover rate of stocks — a vital statistic for food distributors, he noted.

Budgets are automatically prepared for each center based on sales and gross profits. Periodic checks will also be made to show actuals against budget and percentages of variances, the spokesman stated.

The system will also produce weekly statistical summaries of the electronic cash registers which the Wright & Green group uses in its retail operations, he indicated.

Wright & Green expect to have the total system functional by the end of the year, the spokesman concluded.

Militarized Mini From Norden Features PDP-11 Compatibility

NORWALK, Conn. — The PDP-11/34M from the Norden Division of United Technologies Corp. is a militarized digital minicomputer compatible with the Digital Equipment Corp. PDP-11, according to the vendor.

The ruggedized mini features an extended instruction set with more than 400 instructions, the ability to perform single- and double-operand instructions, a memory expandable to 128K words, 900 nsec cycle time in core, byte parity, memory management, hardware multiply and divide and a floating-point option, the vendor said.

It can operate in environments of -65°F to 185°F and in altitudes of up to 85,000 feet, Norden said.

In addition, the unit can withstand vibration, shock and humidity; it meets the requirements of the MIL-E-5400, 16400 and 4158 specifications, the firm added.

A basic one-half chassis PDP-11/34M costs $15,200 to $20,200 depending on configuration; the full-chassis system costs $18,500 to $24,700.

A system with 32K of memory and a communications interface ranges in price from $28,000 to $37,500, Norden said from Helen St., Norwalk, Conn. 06856.

Taxi Fleet's System Sends Cabs to Riders

(Continued from Page 21)

president. "We have to keep those customers happy — and the only way of doing that is to have a cab available when it is needed. The computer system will improve our ability to fill that need."

With traditional voice dispatch systems, there are many instances in which "we send cars out for fares that aren't there. Some people may not know the correct name of the street or fail to give an apartment number."

The system checks out the street and the call taker is prompted to get the apartment number before giving the order to the computer, he said.

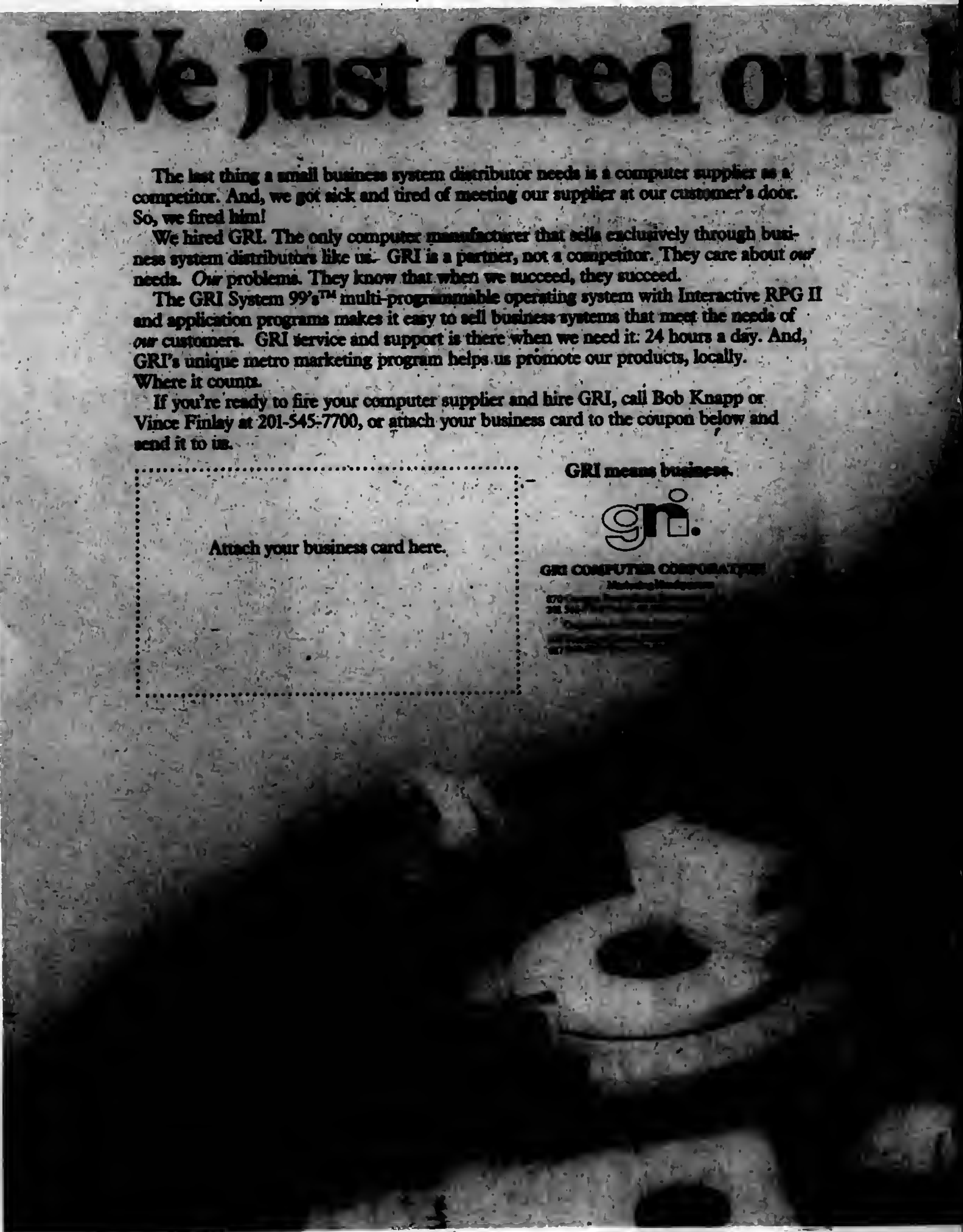
"As for customer convenience, cutting out radio conversation between driver and dispatcher gives a quieter, more pleasant ride. Elimination of the noise is easier on drivers, too; they don't tire as easily — and the result is more money in their pockets," Montgomery said.

DG hardware was chosen for the central system after a recommendation from the firm's software vendor, French added. It was a "toss-up" between DG and Digital Equipment Corp. CPUs and DG was selected "because of cost to a point and because it was a better computer for what we wanted," he said.

A voice link backup is maintained with the cabs if the system goes down and the company needs to revert to its old way of doing business, he noted.

Recently an incident that required backup happened, he continued. The firm wanted to show its system at the Taxicab International Show in Boston and needed to take some of its original equipment to the show because the backup equipment was not ready in time from DG.

"In the process of bringing the equipment back and forth, some of it got damaged and one of the customs people dropped one of the replacement units that were coming into New York," French recalled.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DSC Enhances, Cuts Price of Galaxy/5

WALKERSVILLE, Md. — Digital Systems Corp. (DSC) has reduced prices and enhanced the Galaxy/5 distributed processing computer.

The Model 140 with two CPUs, 128K of memory and two direct memory access channels (DMA) has been reduced from $72,600 to $60,800. The Model 150 with three CPUs, 256K of main memory and three DMAs now costs $120,960 compared with $157,680, DSC said.

The reduction was a result of "normal business review," according to a spokesman.

Three additional devices for the Galaxy/5 system were also announced:

- A 1,300 line/min electrostatic printer costs $6,400.
- A 9-track tape drive with controller, which operates at 1,600 bit/in, and 45 in./sec, costs $9,850.
- A card reader with CPU attachment that can read up to 300 card/min costs $4,300.

Also announced was a directory of system-level software available with the Galaxy/5. It is free of charge, the spokesman noted.

The directory describes the system's operating system, assembler, linkage editor and disk sort as well as various data management techniques available. These include sequential data management, index data management, printer management, an access method for local printers and printer spool files.

DSC is here in Walkersville, Md. 21793.

Forte Has 8-Word PDP-8/A Link

NATICK, Mass. — Forte Technology, Inc. has an 8-word plug-in interface for the Digital Equipment Corp. PDP-8/A system.

The Forte 8W interface allows direct input from a number of external data sources or peripherals, the firm said. Codes for the group of input words and interrupt/skip/clear functions are jumper-selectable, it noted.

Word Arrangement

The eight words are arranged as two words and two interrupts in each of four input connectors.

The 8W can also be used with the standard DEC instruction set to interface a Forte 400 high-speed tape reader to the PDP-8/A. The 150 char./sec reader uses one of the four input connectors, allowing the remaining three to be used for other inputs, the company added.

The interface costs $495; the interface and tape reader cost $1,195, Forte said from 15 Strathmore Road, Natick, Mass. 01760.

DEC-Based CPU Offered for OEMs

HARTFORD, Wis. — General Robotics Corp. (GRC) has an OEM CPU based on the Digital Equipment Corp. LSI-11 micro.

The GRC11/03 includes both an LSI-11 double-sized backplane and a PDP-11 Unibus adapter port; it can be used as a direct replacement for any LSI-11, PDP-11/03 or PDP-11/04 mini, the firm said.

The standard GRC11/03 includes an extended instruction set, floating-point arithmetic, 20K words of random-access memory, extended memory addressing to 512K words, a serial I/O module with switch-selectable data rates, a Unibus peripheral port and eight additional dual-height module slots.

The CPU costs $4,995 in OEM quantities. GRC is at 57 N. Main St., Hartford, Wis. 53027.

Golf Course Owner Aces Time Problem With Small System

TOKYO — Japanese leisure activities firm Kokudo Keikaku Co., Ltd. has scored the financial equivalent of a hole in one.

With the aid of a small business system, the company has cut to eight seconds the amount of time required to process each customer's tab at its golf course at Hakone-Kurakake. Previously it was 60 seconds, according to the user.

Kokudo Keikaku has more than 100 subsidiaries and affiliates. Its operations include 27 golf courses, 36 hotels and such facilities as skiing grounds, skating rinks and swimming pools.

It launched the first stage of a companywide revamping of its complicated front-office operations by purchasing a desk-top computer, the Datapoint 2200 system marketed internationally by TRW Datacom International.

Variety of Transactions

The front office of the Japanese firm's golf links processes a variety of financial transactions involving customers — classification of chits according to customer, billing checks, posting of payments and the keeping of daily and monthly accounts. Payments for caddies and dialy accounts are processed after the close of business.

This daily routine has been increasing with the rise in interest in sports, and DP has become a problem for such courses.

Kokudo Keikaku installed the system in January in what was reportedly a first step toward wider computerization of its varied operations.

Terminal In Gift Shop

Clerks at a course's restaurant, gift shop, refreshment stand and locker room (for caddie payments) operate terminals linked to the front-office computer in an on-line, real-time mode.

The system has simplified front-office jobs and data is gathered more quickly, improving efficiency and reducing manpower needs from four to two clerks, the firm said. Also, customer service has been improved by reducing the waiting time and crowds during checkout periods, according to the user.

Plans are under way for a second installation at the Hakone-Kurakake facility to handle sales records on an item-by-item basis and process statistical information for management reports. The firm is also considering introducing similar systems at its other facilities.

The system at Kokudo Keikaku consists of the Datapoint 2200, diskette storage, a serial printer and several TRW 4103 keypads.

CI Notes

Harris Planning to Buy SDS

NASHUA, N.H. — Harris Corp. and Sanders Associates, Inc. have reached a preliminary agreement for the sale to Harris of Sanders' Data Systems (SDS) Division for about $17 million in cash and the assumption of certain liabilities, the firms announced.

Harris plans to operate SDS as part of its Data Communications Division and to retain current management.

Harris President Richard B. Tullis said the line of Sanders terminals will complement Harris' position in the remote batch communications segment of the distributed DP market. The firm plans to increase production of the 8170 and 8180 terminals, he added.

Since plans call for the acquisition of SDS at a price below book value, Harris expects to operate SDS profitably from the outset, he said.

The pretax loss to Sanders is estimated at about $19 million, according to Sanders President Harold Pope. However, earnings from its Federal Systems Division will substantially reduce the reported loss for this fiscal year, and future tax benefits are expected to fully offset the loss, he said.

The proposed agreement does not involve Sanders' Military Systems Division, which also makes CRTs, or Sanders' antitrust litigation against, IBM a Sanders spokesman said.

Adds Asks Court to Halt Sale of Milgo Stock to Racal

HAUPPAUGE, N.Y. — Applied Digital Data Systems, Inc. (Adds) has obtained a federal court order temporarily restraining Milgo Electronics Corp. from selling stock to Racal Electronics Ltd. [CW, Dec. 13].

The order bars Milgo from selling 321,000 shares of common stock to the British firm.

Adds had previously made two offers to acquire control of Milgo in an exchange of stock, but Milgo management opposed the plans [CW, Nov.22].

CA Wins Distributed Net Award

IRVINE, Calif. — Computer Automation, Inc. (CA) has received an order for its Syfa systems from Fireman's Fund Insurance Companies (FFIC), a unit of American Express Co.

If fully implemented, the order to meet requirements for a nationwide DP network will include 50 Syfa systems and result in revenues in excess of $5 million.

Three Firms Win Contracts

GSA Opens Federal Teleprocessing Arena

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. — Three companies have recently garnered approval from the General Services Administration (GSA) to market their teleprocessing wares to federal agencies here.

Computer Network Corp., First Data Corp. and United Computing Systems, Inc. are the first of many companies to be included in the GSA's Teleprocessing Services Program (TSP), a program valued at $50 million to $80 million.

Under TSP, agencies can acquire interactive, remote batch and "full" (including interactive and remote batch) services from commercial vendors, according to Dr. Michael Muntner, assistant commissioner of assistance for agency planning and policy in the GSA.

Effective since last August, TSP at once fills the void created by the expiration of the GSA contract with Computer Science Corp. (CSC) and its Infonet on June 30 and satisfies an increased emphasis within the Federal government on DP services provided by the private sector, according to an industry consultant.

To a company, the firms holding a place on the TSP contract schedule believe the marketplace, dominated for four years by the GSA contract with CSC's Infonet, will open up.

"Being a prequalified, prenegotiated vendor to the federal agencies is the biggest advantage TSP provides," according to Jim Burley, vice-president of marketing for First Data. "We're in the club now."

Infonet had "a virtual monopoly" in offering teleprocessing services to the government, he added.

Principle Advantage of TSP

Paul Michael, federal marketing manager for United Computing Systems, stated the principle advantage of TSP this way: Because the program will become mandatory for federal agencies in search of teleprocessing services from the commercial marketplace once enough companies are on the contract schedule, "if you're not on the program, you're virtually out of consideration."

The exact number of companies needed to make the program mandatory for the agencies remains in doubt, Muntner said. The GSA wants to be sure the companies on the schedule are collectively capable of covering the Federal government's teleprocessing needs before it requires the agencies to select services from them.

"We'll make the program mandatory along the lines of the Schlitz commercial — 'When it's right, you'll know it,' " he said. Muntner suggested "right" might mean "a couple of dozen companies" placed on the schedule over the next two months.

Even after TSP becomes mandatory, the program will remain open-ended in that it will continue to award contracts to deserving firms, he added.

Temporary Regulations

Not all teleprocessing services fall under TSP, according to the program's temporary regulations.

Services not included are local batch processing or facilities management offerings.

In addition, TSP does not govern a teleprocessing system dedicated to an agency's particular application or arrangements in which the Federal government owns the equipment at any time or reimburses the vendor 100% for the equipment under a cost-type arrangement.

The TSP regulations explained agencies have two methods for acquiring commercial teleprocessing services. Agencies can place orders for interactive, remote batch or full services from those firms approved by the GSA and on the schedule.

They can also open their jobs up for full competition in the broader marketplace when they believe lower costs are available

(Continued on Page 29)

International Trade Confronts Hostile Environment: Anderson

DAYTON, Ohio — Despite its vital contribution to the domestic economy, international trade today faces an increasingly hostile environment, according to William S. Anderson.

Anderson, chairman of NCR Corp., which generates half its business overseas, pointed out exports now account for over 10% of all goods and services produced in the U.S., double the percentage of just a few years ago.

Export-related jobs now total more than eight million, he added.

Despite the obvious importance of international trade, the problems currently faced by companies doing business overseas have received little attention, Anderson said.

Foremost among those problems is inflation which more than any other factor "is responsible for the sluggishness of the world economic recovery," he said, while also citing rising raw-material costs, the trend away from a global economy concept, increasing nationalism and shortsighted government policies.

Tax Reform Act

Although international trade helped cushion the recent recession and can be a significant factor in leading the current economic recovery, the Tax Reform Act of 1976 lessens the incentives of U.S. business to engage in overseas operations, Anderson said.

As an example, he cited the reduction of tax benefits available to domestic international sales corporations (Disc) which were created to put U.S. exporters on a par with many European exporters.

The new tax law also increases taxes on dividends earned in less developed countries and eliminates most tax incentives formerly available to Americans working abroad, he noted.

And the Tax Reform Act failed to take steps that would help the domestic economy, Anderson asserted.

"It passed by the opportunity to encourage job-creating capital investments, even though we desperately need such investments if the U.S. is to retain its economic leadership," he said.

Because of the lack of incentives to make such investments, productivity in the U.S. has increased only 15% in the last 10 years, he said, compared with gains of 65% in West Germany and 130% in Japan.

Equally important, the percentage of the Gross National Product going to research and development in the U.S. is almost 25% below its peak level of 1964. This means the U.S. is in danger of losing its technological leadership, he said.

An initial step business can take in overcoming current problems in international trade is to sell its benefits more effec-

(Continued on Page 28)

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Adapso Wants Public to Have Chance in EFT Race

By Toni Wiseman
Of the CW Staff

WASHINGTON, D.C. — Agencies of the Federal government should be prevented from entering into three elements of electronic funds transfer (EFT) — entry, delivery or processing — until the private sector has an opportunity to foster such systems in a competitive environment with minimal government intervention or regulation, according to the Association of Data Processing Service Organizations (Adapso).

"We have no objection to the use of computer equipment by federal instrumentalities such as in the case of the Federal Reserve System," William W. Fletcher, chairman of Adapso's EFT Systems Committee, testified before the National Commission on EFT here recently.

"Where computer equipment is used by the Federal Reserve to increase efficiency in its clearing, distribution and settlement functions, the regional interconnection of automated clearinghouses would not appear to be an improper use of computers.

"They are merely a function electronically which had previously been handled by other business machines," Fletcher said.

Adapso would, however, "strongly object to an attempted utilization of such an interconnected network for the entry, delivery or processing functions anticipated within the [EFT] systems," according to Fletcher.

"The incremental use of such equipment in servicing point-of-sale terminals or in performing DP service functions — such as are normally provided by a host computer and its software programs — would create unnecessary barriers to the entry of members of the data service industry into the marketplace," he said.

In this connection, he said, Adapso would view the use of automated clearinghouses in processing data from private corporations for preauthorized payments to be a processing step more appropriately reserved for the private sector.

Addressing the question of privacy and security, Fletcher said he has no doubt "proper security and privacy controls can and will be developed by the private sector in establishing such networks" and he cannot "see the need for a federal agency to intervene in establishing such communications network for a presumed 'public need.' "

In fact, he said, in his opinion greater security is likely to arise if competing companies are permitted to innovate security devices within their private communications networks.

Several competing communications networks or switches, each with its own security system, would offer the public more protection than one national system with a uniform algorithmic key or encryptographic coding, he said.

"The federal role should be confined to regulating and controlling a network communications system and then only if the private sector fails to develop those systems which satisfy the public need," he contended.

In his testimony, Fletcher also said Adapso has long supported a "maximum separation doctrine," preventing the improper spillover of power from one market to another.

Fletcher cited both computer service companies and federal agencies who possess both "delivery system" and "processing system" capabilities.

They should be required to use separate corporate names, separate marketing or executive personnel and separate facilities and should be restrained from intermarket transactions (such as tie-in sales) to the extent required to permit "fair competition."

Recycling Effort Aids Tape Manufacturing

Special to Computerworld

SUNNYVALE, Calif. — Emission control is not limited to cars nor is recycling limited to cans, paper and bottles.

Information Terminals Corp. (ITC) has installed a "one-of-a-kind" $100,000 recycling system to recover the exotic and highly volatile solvents used in the manufacture of magnetic tape, according to a spokesman.

As a result, ITC has also reduced the plant's emissions to less than those given off daily by the plant's employees' cars in their daily commute to work, he said.

The solvent recovery system gives ITC a production cost advantage in the industry since its ability to recycle expensive solvents will save a great deal of money that, in other operations, goes out the exhaust fans, he noted.

ITC's solvent recovery system works very much like a charcoal filter does on a cigarette, according to the spokesman.

During the magnetic coating process, the solvent evaporates as the coating is applied to a polyester substrate. The magnetic coating is what does the recording. The warm air containing the solvent is then drawn off through activated charcoal traps in large tanks outside the building, he explained.

As a result of this solvent recovery process, ITC could continue in operation for as long as a year without having to buy new solvent. This is an important hedge against the possibility of another unexpected petrochemical shortage, he added.

The solvent recovery system was constructed by Vic Manufacturing Co. under the guidance and according to the design of Jerry Newton, ITC's vice-president of media development, and Frank Fitz, media manager.

Researchers Want Data On Joint Ventures

GAINESVILLE, Fla. — A team studying domestic joint ventures in the computer industry is seeking information in return for a copy of the completed study.

University of Florida professors Sanford Berg and Philip Friedman are conducting the study as part of a larger research project sponsored by the National Science Foundation.

The purpose of the study is to determine criteria by which joint ventures in the computer industry may be evaluated in terms of their effect on competition efficiency, new entry and innovation.

The study seeks information not only on joint ventures, but also on the extent to which various factors such as patents, financial constraints and rapid market penetration influence decisions to participate in a joint venture.

For further information, contact Berg or Friedman, Department of Economics, University of Florida, Guinesville, Fla. 32611.

Systems for all reasons

Computerworld presents a special report on *Dedicated Systems - Turnkey and otherwise* in the January 31st issue.

The cost of raw computer power has plummeted so far in the last 20 years, that it has now become economical to devote entire computer systems (large and small) to the performance of single tasks. These special purpose computer systems fall into two general categories, dedicated systems and turnkey systems. They'll both be covered in our January 31st Special Report.

Edited by Esther Surden, the report will include stories on computer systems that: scan hearts, direct traffic lights in Rome, switch telephone lines for Californians, make investment projections for investors in the futures market, manage energy use, work in libraries, make maps, test students at Brigham Young University, and more.

This special report will cover the hardware and software used in these systems, with tutorials on turnkey and commentary on the problems of system integration, which should be of special interest to large scale users. If you'd like to learn more about the innovative tasks computers perform these days, be sure you read *Computerworld's* special report in the January 31st issue. And if you're in the business of designing, developing or marketing special purpose computer systems, make sure you reserve ad space in this *Computerworld* special report. Ad closing date is January 14. See your *Computerworld* salesman for complete details, or call Judy Milford at (617) 965-5800.

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Here's why Digital's PDP-11/70 is the fastest selling supermini in the world.

In the short time that the PDP-11/70 has been offered, Digital has shipped over 1,000 of them. Customer applications include everything from laboratory research and education to extensive communications and commercial transaction processing.

What makes the 11/70 so popular? There are almost as many reasons as there are users. In conversations with a wide range of customers, four major reasons are repeated time and again: throughput, reliability, software and Digital itself.

"We went to PDP-11s initially because no other systems offered the price/performance. User response was so enthusiastic that we added more terminals and expanded to the 11/70. Our users love it. Reliability has been exceptional."... D.H. Casagranda, Manager, Corporate Systems, ATCO Industries, Ltd.

The 11/70 is a very powerful computer, designed throughout to handle more data far faster than machines costing 5 times as much. It's supported by an outstanding selection of software. And since it's made by Digital, you can expect the highest quality, reliability and support services.

"We have a highly challenging mix of computing requirements. The 11/70 has come through with flying colors."... Loren Gilmore, Corporate Manager of Engineering and Process Control Systems, International Harvester Company.

If you're wrestling with a mixed bag of computer needs, the PDP-11/70's your machine. It has an impressive variety of operating systems, languages, data management facilities and applications packages. It can handle real-time, timesharing and batch in any combination at the same time.

"We chose the 11/70 because it had all the tools we needed for a heavy transaction processing workload. And it's lived up to all our expectations."... R.E. Umbach, Manager, Intercom Systems, Walgreens.

More and more organizations need a system that provides fast turnaround of up-to-the-second information to dozens of users simultaneously. The 11/70 gives it to them: the operating systems, the database tools, the communications and the raw operating speeds themselves.

"The 11/70's power was impressive, but it was primarily the software that sold us."... Mel Culp, Systems Services Manager, Allis Chalmers Power Systems, Incorporated.

The PDP-11/70 comes with a choice of three major operating systems — IAS, RSTS/E and RSX-11 — that fit just about any operating requirements. Several languages, like COBOL, FORTRAN, BASIC, APL, DIBOL and RPG-II. And various data management systems, including multi-key ISAM and the only CODASYL-compatible Data Base Management System available in its class.

"There were only two companies that had the communications capabilities we wanted. On all counts the 11/70 was superior."... Royle Vagle, Director of Data Processing, Cooperating School Districts of the St. Louis Suburban Area, Inc.

Digital is ahead of everyone in the area of data communication capabilities. There's the DECnet software that lets you communicate with a broad range of Digital computers, from micros to maxis, and a wide range of interfaces, terminals and services.

"Reliability was a critical requirement, and we got it. We've had only one machine failure in six months."... Charles Holmes, Manager of Computer Services, Farinon Electronics.

Up-time, in fact, was one of the major goals in the 11/70's design. It started with the selection of the most reliable components tested under worst-case conditions. And culminated in a system where operations are continuously monitored by hardware or software. If you do have a problem, the 11/70 diagnostics and packaging make it one of the most quickly serviceable computers on the market.

"Digital had the system, the software, and the support. Their commitment has been solid from the outset."... Gary Bernstein, Manager, Computing Systems, Biomedical Engineering Unit, McGill University.

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"It was an easy decision. Both Digital and the 11/70 had an excellent track record. And they've both lived up to it."... Raymond Neff, Director, Health Sciences Computing Facility, Harvard University School of Public Health.

For more information on Digital's PDP-11/70 call your local Digital representative. Or send the accompanying coupon.

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IBM Lost 'Total Control' Over User Community: Biddle

ARLINGTON, Va. — "For the first time in our industry's history, IBM has lost its total control over the user community — it is the user that is now constraining IBM's moves, not IBM itself," Jack Biddle recently told the Computer Dealers Association.

Analyzing the shift that has taken place in the computer industry in the past several years, Biddle, president of the Computer and Communications Industry Association (CCIA), noted the rapidly increasing sophistication of key decision makers in the DP user community.

He also pointed out that procurement decisions are now made only after lengthy cost analyses — no longer are procurement dollars committed on the golf course.

"More and more users are becoming multivendor shops and liking the improved performance and vendor responsiveness they have gained," he said, adding many users had greatly increased their technological understanding of both hardware and software in order to take advantage of the benefits offered by the minis and micros.

"The user realizes he cannot tolerate another revolution like the 360, but must instead protect his massive investment in system familiarity and in software through a careful evolution," Biddle continued.

He further said users are now insisting that any new computer product handle existing software, peripheral equipment and procedures with the barest minimum of disruption — a trend which has lessened the fear of obsolescence considerably, consequently firming up prices in the used computer equipment market.

One of the greatest changes among users, according to Biddle, is that "they no longer need to be at 'the leading edge' among their peers."

The sophisticated user is looking over the entire market carefully, he added, and discovering "a lot of suppliers out there with technology equal to or superior to IBM's, with service as dedicated and competent and with a strong desire to provide solutions to user problems that are to the benefit of both the user and themselves."

Interesting Dilemma

"IBM finds itself in an interesting dilemma," Biddle remarked.

Noting its original schedule for the introduction of a new generation — the Future System and its operating System Q — was next year, he said IBM had run into three unforeseen problems.

First, the necessary software proved a larger undertaking than even IBM's resources could handle.

Next, the user didn't allow himself to be shifted to Multiple Virtual Storage and virtual machine-oriented systems or hooked on the idea of large integrated data bases as IBM thought he would.

And lastly, IBM realized the "communications-oriented DP network of the future had to have access to a switched network" with higher capability and at lower cost than those available from Bell.

While these obstacles effectively prevented IBM's introduction of its next generation, Biddle said, "IBM management still had to maintain its 14% per year rate of growth."

IBM accomplished this by shifting lease purchase ratios, he contended. The increased sales additionally provide it with the capital necessary to finance Satellite Business Systems, to expand the General Services Division and to further erode Xerox's control over the copier market — the three ingredients to the real growth that will take place in the 1980s as the transition to the electronic "office of the future" begins, he said.

Speculating on the industry environment in the next few years, Biddle suggested "we will see a continuing kludge of new IBM offerings," each apparently directed toward a relatively narrow segment of the market, but each containing later enhancements "unknown to all but IBM."

He predicted a period of "IBM-inspired uncertainty with the clear IBM message that 'there will be massive change . . . in '79 or '80 or maybe '81 — play it safe — don't stray too far from IBM.' "

Concurrently, IBM will try to change the entire pricing structure of the industry, he added.

Biddle remarked this is "the first real chance that this industry has ever had to become truly healthy and truly competitive. You see, IBM has killed off its competition — but competition thrives."

The dwarfs, Burroughs, NCR, Honeywell, Univac and Control Data Corp. — the traditional mainframers — have learned their lesson, according to Biddle. "They cannot displace an entrenched IBM system any more than IBM can replace theirs," he explained.

So even the "10 percenters have learned you can't divide 30% of the market" between seven competitors and have each come out with the 10% needed to be viable and begin to specialize, he stated.

Dealing With Specialists

IBM has always been able to deal with "specialists" before by aiming "its mighty howitzer" in their direction, Biddle said. But today, he added, "everywhere IBM looks there are little companies . . . offering the user more innovative products and services than IBM."

In order to "deal" with them all, IBM "must offer equal or superior products all across the board at prices that are competitive with some pretty lean and hungry outfits. That has to be an almost insurmountable challenge," he said.

All this indicates the competition will continue to grow stronger, healthier and financially sounder, he noted.

In his concluding remarks, Biddle recalled that "four years ago I compared our industry to a race between Secretariat, seven mules and 70 lame ducks. It wasn't a horse race — it was a parade. Today, I think a different analogy is appropriate.

"Our industry is in a field of clover — Secretariat is still there, a little fatter but munching his share. But today that field of clover is populated by hundreds of quick and agile rabbits — and believe me, a couple of hundred rabbits can eat one hell of a lot of clover."

Hostile Environment Confronted: Anderson

(Continued from Page 24)

tively, Anderson suggested.

He also called for a reduction of trade barriers and urged businessmen to broaden their view of potential markets to include the entire world, not just portions of it.

Despite current problems, there remains great opportunity in international trade, Anderson said. The markets are huge and the U.S. is more competitive today because wages abroad have caught up with and, in some cases, surpassed wage levels here.

In addition, there are encouraging signs of economic recovery in most foreign economies, there is plenty of potential for productivity gains in the U.S. and — despite increasing governmental controls — the U.S. economy still offers greater flexibility than most other economies, he said.

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GSA Services Program Widens Federal Teleprocessing Options

(Continued from Page 24)

or if the schedule contractors can't meet their requirements or conditions.

Agencies will be allowed to "sole-source" an order if only one vendor on the schedule can meet their needs, the regulations stated.

Even while they will have a group of preapproved vendors from which to select, the agencies will be required by the GSA to evaluate these firms to determine which can deliver the desired service for the least cost over the system's life, the regulations said.

Specifically, at least three technically capable firms must be benchmarked if the system life cost exceeds $500,000 or the annual cost goes over $200,000. If the annual cost exceeds $400,000 or if the system life cost goes beyond $1 million, all technically capable firms on the schedule must be benchmarked, according to the regulations.

'Everybody Wins in TSP'

Muntner emphasized that "everybody wins in TSP" and "there are contracts for every vendor who participates with the GSA in defining the services it offers and how these services are provided.

The GSA does require vendors to offer the Federal government discounts better than their best commercial offerings. In addition, Muntner said the firms must provide volume discounts based on the amount of government business each one does.

Infonet is likely to be offered a contract under TSP, Muntner said. At present, CSC's old contract has been extended through September 1977 with the potential for agencies to extend their use of the network for an additional year.

However, this contract extension applies only to existing agency applications, he said.

Lessons Learned

The GSA's contract with CSC, begun in March 1972, taught the administration many things, Muntner maintained, and these lessons have been incorporated into TSP.

For example, Muntner said the contract with Infonet failed to define what the government meant by "interactive," "remote batch" and "full service."

The result was that if an agency's needs met the full service scope that Infonet provided and if the agency wanted to "go commercial," it had to use CSC's service even if some other approach was cheaper, he explained.

By the same token, if an agency didn't meet the scope of this full service contract, it couldn't go with Infonet, Muntner said.

Time Savings

In addition to learning to allow for those agencies who want only interactive or remote batch services, the GSA discovered the time saved by the agencies working through a contractual vehicle like the Infonet contract and TSP was important. Muntner said the GSA also learned the value of discounts for the government from vendors.

The industry generally appears to be in favor of TSP, Muntner commented, adding another franchise to provide teleprocessing services, whether to CSC or to some other vendor, would have received a violent and negative reaction.

Muntner said the agencies might not find it as easy to get service from the TSP contractors because of the least-cost evaluations required by the GSA.

Agencies' Position

Michael of United Computing also feels the agencies don't think TSP will make it easier for them to acquire teleprocessing services, even though that is the GSA's goal.

Even under the scheduled portion of the TSP, the agencies will continue to write requests for proposals whose specifications may lock out 80% of the vendors capable of meeting the majority of their needs,

"The agencies don't really save anything," he continued. "It often costs a fortune to write such specifications." The costs will generally be much less for the agency that buys from a firm listed on the TSP schedule, he maintained.

In addition, an agency can select a number of vendors from the schedule, each of whom can perform one part of its job.

By taking what's best from each vendor, the agency can split the contract up in order to end up with the most cost-effective system, Michael said.

TSP makes agency procurement for teleprocessing services from the commercial market fairer to the industry than it has been in the past, Michael added. "Everyone is under the same rules. No one will get a better deal than someone else," he said.

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Contracts

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Ontel Corp. has received an OEM contract valued at over $10 million from AEG-Telefunken. The contract calls for a four-year shipment of Ontel's OP-1 intelligent terminals.

Computer Sciences Corp. has received a $4 million contract for computer facilities management from Mason-McDuffie Co. of Berkeley, Calif., a mortgage banking firm.

Florida Software Services has been awarded DP service contracts from the DeLand State Bank and the Coronado Beach Bank.

Nippon Electric Company Ltd. has received a contract from the International Telecommunications Satellite Organization for a 14 gHz mixer/intermediate frequency amplifier.

Pepperdine University has signed a contract agreement with Syatems and Computer Technology Corp. to improve computer services for the university.

Dataproducts Corp. has signed a $3 million printer contract with Data Card Corp.

Boeing Computer Services, Inc. has been awarded a five-year contract by the Air Force Computer Acquisition Office to provide the Tactical Air Command with software support services for the E-3A airborne warning and control system.

Executive Corner

- Theodore E. Wentz has been appointed vice-president of finance and treasurer of Viking Industries, Inc.
- Kenneth Moyle has been appointed vice-president of wafer manufacturing and process technology for Electronic Arrays, Inc.
- Lawrence D. Sault has been named vice-president of industry operations for the Commercial Division of Computer Sciences Corp.
- Fairchild Camera and Instrument Corp. has promoted six of its executives to division vice-presidents. They are John F. Ordway, national sales manager, Semiconductor Components Division; William J. O'Meara, strategic marketing unit manager, Large Scale Integration Group; William L. Kirkham, general manager, Diode Division; Edward R. Browder, general manager, Digital Products Division; Manuel A. Fernandez, general manager, Transistor Division; and Brian E. Sear, general manager, Systems Technology Division.
- Microdata Corp. has appointed Lou Hribar vice-president of marketing, Ron Murray vice-president of sales and Don Pagan vice-president of service.
- Michael Smith has been named manager of planning services for the Petroleum Systems Division of Scientific Software Corp.
- J. Patrick Carey has been named director of marketing for Escom, Inc.
- Norman D. Heller has been named director of systems development in the marketing department of Microdata Corp.
- C.L. McCarty has been appointed director of marketing for the Data Products Division of Lockheed Electronics Co., Inc.
- Richard C. Cowden was named director of general engineering, George H. Whittaker was named director of peripheral development and Leon Wun was named director of systems development at Mohawk Data Sciences Corp.

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Keene is one of New Hampshire's nicest communities. New Hampshire has NO state sales or income taxes. If you want to work and recreate in a rural setting that's close to metropolitan areas, send full resume in complete confidence to:

Michael Cabot
Peerless Insurance Co.
62 Maple Avenue
Keene, N. H. 03431
— or call — 1-(800)-258-5303

AN EQUAL OPPORTUNITY EMPLOYER

District Sales Manager

WANGCO is searching for a District Sales Manager. You must have 4 years' current field sales experience with a computer manufacturer preferably cartridge disc drives. Peripheral sub system experience considered a bonus. Electronic engineering degree or equivalent.

Position is in the Southeastern United States. Excellent company benefits.

Send resume, including salary history, in confidence to:

Bob Kroskrity
535 Broadhollow
Melville, N.Y. 11796

An Equal Opportunity Employer

NATIONAL SALES MANAGER

Our client, a National Computer Service firm headquartered in California is seeking a dynamic, results-oriented National Sales Manager to effect a penetration of new markets. In-depth knowledge of telephone company structure to include key decision-making individuals is required. Specific experience necessary to qualify for this position includes:

- A proven track record, of successful sales achievement.
- A comprehensive knowledge of data systems software and programming, and
- Experience in, or readiness for, Sales Management.

The qualified candidate must be capable of producing near-term revenues from existing accounts as well as formulating and executing a marketing strategy for future business expansion.

Compensation package is flexible. If modest goals are met, annual income will be in the fifty thousand dollar range, with no upper limit on commissions.

We are consultants to management. For immediate consideration, please send resume and salary history in confidence to CW Box 4847, 797 Washington St., Newton, Mass. 02160.

PROGRAMMER NEEDED

Mini-computer programmer for Hospital and clinic operations needed to write programs for accounting and research procedures. Anticipate using IBM System 32 computer. Some accounting knowledge would be helpful to act as assistant controller. Organization located in southeastern Kentucky, Call personnel Manager for interview, (606) 672-2901.

EDP SYSTEMS SPECIALIST

Salary area $18,000

Do you have good client contact skills?

The challenges of designing new commercial systems and of interfacing heavily with users are both yours in this new position. Work in a project group under the DP Manager in this energy company's expanding EDP department. Two years EDP experience desired.

For further information, please contact Tom Fischer at (713) 658-9898.

ALL FEES ASSUMED BY CLIENT COMPANIES

M. David Lowe
Personnel Services, Inc.
420 Houston Natural Gas Bldg.
Houston, Texas 77002

EDP SYSTEMS ANALYST

We are a growing multi-line insurance company doing business in 11 Northeastern states. We are seeking a "Results Oriented" Systems Analyst with a demonstrated record of performance. The position requires 3-4 years of insurance systems experience with a heavy emphasis on EDP. Candidates should more specifically have a life-data base or general P & C background.

We offer a sound company paid benefit program and salary based on experience and qualifications. Send resume and salary requirements to:

Personnel Director
FARM FAMILY INS. COS.
P.O. Box 656
Albany, N.Y. 12201

An Equal Opportunity Employer.

PROGRAMMING MANAGER

New position in expanding 370/145 shop offers high visibility to strong technician w/proven mgmt ability. Requires min 5 yrs COBOL prog exp, in-depth bkgd. 360/370 DDS or DDS/VS + knwl mfg systems. Knowl BAL. T/P a plus. To $20K. Fee paid. Contact Bill Grady (in confidence)

ROBERT HALF
PERSONNEL AGENCIES
140 Federal Street
Boston, Mass. 02110
(617) 423-8440

ASSISTANT DATA PROCESSING MANAGER/ ON-LINE SYSTEM

Class 1 Motor Carrier located in South Bend, Indiana requires a Programmer with thorough RPG 2 experience to supervise its developing on line system. The ideal candidate will have experience working with an existing on line system for another motor carrier. Excellent salary and benefits. Please send resume to Director of Personnel, Room #5, Tucker Freight Lines, Inc. 1415 S. Olive St., South Bend, Indiana 46627.

THE ZIA COMPANY

Los Alamos, New Mexico 87544
Prime Contractor to ERDA

ELECTRICAL ENGINEER POWER PLANT

Position open for person with an engineering degree or equivalent, and experience with hardware and software equipment similar to TRW SCADA system using MOD-COMP II Computer and Conventional controls for an electrical generating power plant.

Apply or send resume to:

Personnel Director
THE ZIA COMPANY
Los Alamos, New Mexico 87544
(An equal opportunity employer)

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data processing

The Crane and Excavator Division of FMC Corporation, a long-time quality designer and manufacturer of LINK-BELT® cranes and excavators, due to current expansion has immediate openings for experienced individuals in the following fields:

data base administrator

This position requires an individual with extensive IMS-DL/1 experience, proven analytical skills, and experience in data base design for communications-based systems. This ground floor opportunity requires an individual to aid in the planning of our new system and analyze and recommend data based solutions for the system requirements.

Excellent starting salaries are offered to match your experience in all of the above positions, a comprehensive company paid benefit package and a great location for work and family life. Send your resume or a letter with salary history to: Mr. Terry Fouts, Manager or Professional and Technical Employment; FMC; Crane and Excavator Division; 1201 Sixth St., S.W.; Cedar Rapids, Iowa 52406. We are an Equal Opportunity Employer M/F

FMC

PROGRAMMERS/ SYSTEMS ANALYSTS

NCR's CRITERION COMPUTER SYSTEM has created immediate openings at NCR San Diego

- Design and implementation in support of major subsystems of a large, multiprogramming virtual storage operating system.
- Support/enhance compilers, operating systems and peripheral software.
- Design, develop, implement and test COBOL, RPG, and other high-level language integration support applications and test programs.
- Develop special diagnostic test programs for Criterion. Examine hardware logic, write test segments, incorporate debug facilities required by techs and document program use.
- Design and develop virtual machine firmware for a new computer system. Knowledge of operating systems and compilers required. EE or CS Degree plus 5 years' programming experience with at least 2 years' assembly programming.
- Design, program, test and document business applications for support of product development processes.

Employees will enjoy excellent salary and top working conditions with a commercial employer. Fully paid life, hospital and medical plan for employees and dependents.

Please submit resume (which MUST include salary history) to:

PLACEMENT DEPARTMENT

NCR

Data Processing Division
16575 W. Bernardo Drive
San Diego, Calif. 92127

An Equal Opportunity Employer

DIRECTOR OF DATA PROCESSING

Computers and systems analysis are "second nature" to the candidate we seek to guide data processing development at our new, regional Medical Center. Located in the heart of Maryland's rustic "Eastern Shore", we can offer wholesome, family-centered living; yet, our cultural attractions are "excellent", ranging from a four-year college through unrivaled outdoor attractions.

If you have 5 - 10 years of relevant data processing experience, preferably in a medical setting, and a college degree, we would like to hear from you. Please send your resume, including salary history, to CW Box 4849, 797 Washington St., Newton, Mass. 02160.

AN EQUAL OPPORTUNITY EMPLOYER, M/F

SENIOR PROGRAMMER/ ANALYST

Excellent opportunity with a NYSE manufacturing-distributor subsidiary located in the Midwest. Must be experienced in RPG II with four years experience in accounting, cost and inventory control systems. All replies will be kept confidential.

FRANK SMITH

SAFELITE INDUSTRIES

P.O. Box 1879
Wichita, Ks. 67201

or call 1-800-835-2364

South Florida Programming Opportunities

make milgo your future

Milgo Electronic Corporation, a leading manufacturer of data communication equipment located in South Florida, has an immediate opening for a Systems Specialist. The individual we seek shoud have 2-5 years systems analysis and programming experience with business applications. A knowledge of ANS Cobol in an on-line data base oriented environment required. Experience with Univac 1100 series computers helpful. College degree preferred.

Also, we have additional programming openings in Engineering that require microprocessor and mini-computer experience.

Milgo offers excellent salaries, complete company benefits, liberal relocation allowance and the benefits of South Florida living. To arrange for your personal interview, call Dan Haynes collect at (305) 592-8600 or send your resume in complete confidence.

Milgo Electronic Corporation
8600 N.W. 41st Street Miami, Fla. 33166

Equal Opportunity Employer

GROWTH

GROWTH

GROWTH

YOURS AND OURS — We need ten career-oriented computer systems professionals to staff our expanding consulting offices located in the NE, SE and MW. Positions range from Senior Programmer to Project Manager. We offer:

- Development and Implementation - No Maintenance
- Diversity of Application Areas
- State-of-the-Art and Management Science Technology
- Variety of Large Scale Computer Equipment
- Wide Exposure and Involvement with Users
- High Visibility on small but Highly Professional Project Teams
- Unstructured Creative Atmosphere
- Highly Competitive Salaries and Excellent Fringes
- Exceptional GROWTH Opportunities

Minimum qualifications required are two or more years of demonstrated COBOL programming proficiency, a college degree, and an aggressive willingness to be challenged and GROW.

If you are interested in this unique opportunity to further your career, please send your resume including salary history and a statement of your objectives, in complete confidence to:

CW Box 4852
797 Washington St.
Newton, Mass. 02160

An Equal Opportunity Employer M/F

PROGRAMMER ANALYSTS PROGRAMMERS

Put your skills to work in an atmosphere of true professional excellence — offering high visibility, wide variety of applications and advancement opportunities. Ideal candidates will be experienced (2-5 years) in applications and development programming for the casualty insurance or financial services industry. Software development experience an additional plus. IBM 370-135, 138 DOS-VS shop, using COBOL, BAL, RPG.

Top salaries, benefits, working and living conditions in beautiful lakeside city of 50,000 in Wisconsin, America's Vacationland. Interested? Send letter or resume including salary history and requirements to S.L. Sisson, Personnel Director.

HERITAGE INSURANCE
2300 Kohler Memorial Drive
Sheboygen, Wis. 53081
Equal Opportunity Employer

Programmer/Analyst Property & Casualty Insurance

We are a highly successful, medium sized Insurance Company with an opportunity for individuals with at least two years of Cobol Programming in a property and casualty insurance environment. Excellent benefits and working conditions in an ideal small town atmosphere. Send your resume to M. Sevan, Westfield Companies, Westfield Center, Ohio 44251.

SR. PROJECT MANAGER

Do you enjoy dealing with clients on a direct basis? Expanding service bureau has many diverse projects. Exp with IBM, COBOL, PL/1 and some mini exposure. You will be paid for decisions. $30K, fee paid.

ROBERT HALF
PERSONNEL AGENCIES
522 Fifth Avenue
New York, N.Y. 10036
(212) 221-6500

FACULTY POSITION
Department of Computational Science
UNIVERSITY OF SASKATCHEWAN

Applications are invited for a tenurable faculty position at the assistant or associate level, Ph.D. in computer science or closely related field required. Position may be filled on a temporary basis by a person with a M.Sc. in Computer Science. Strong interest in systems analysis, data bases, data processing or information systems is essential. Must have thesis in one of these areas or related practical experience. Department faculty of ten with good publication record, and established undergraduate and M.Sc. programs, salary at appointment within range $16,500-$27,500. Appointment July 1, 1977.

EDP OPPORTUNITIES

AVP Trust Systems-NYC-automate existing system — $40-45M
CORPORATE Planning-NYC-econometrics Mgt Sci-O.R. — $30-40M
AVP Financial systems NYC-Big 8 or CPA. Controllers division — $30-35M
MANAGER P/S NYC 370 OS/VS CICS — $28-32M
SALES NYC-major vendor lge scale or mini exp —, To $30M
MANAGER S/P NYC 370 DOS CICS-direct staff of 20 — $25-28M
SYSTEMS Consint-NYC-Fortune co mfg systems. 20% travel — $28-29M
SR. SYSTEMS ANAL-NYC-major client-planning CICS applications — $25M
PROJECT Mgr NYC-auto issue-C.F.O. — $24M
SOFTWARE Support-NYC CICS/VS-Sysgen MIs — $19-23M
PROJECT Leader-NYC-CICS credit applications — $21-23M
SYSTEMS Software-NYC-financial client IMS OS degree — $21-23M
SALES NYC-mini computer-turnkey systems — $18-20+ comm.

Bill Borrelli (212) 349-3610
William Harris Associates
150 Broadway
New York 10038

DATA BASE SUPPORT

Leading Mid-West health insurance company has career opportunities for candidates with Data Base related experience.

Selected candidates will meet challenges in a dynamic large-scale multi IBM system computer center using OS/VS, IMS DB/DC and telecommunications. Available positions:

Data Base Technical Specialist
Data Base Applications Specialist
Data Base Document Specialist

We provide a complete company paid benefit program, relocation and promotional and professional growth opportunities. For immediate consideration, forward detailed resume and salary requirements to Ron Morris, Employment Office:

BLUE CROSS AND BLUE SHIELD OF INDIANA
120 West Market Street
Indianapolis, Indiana 46204

An Equal Opportunity Employer M/F

Programmer

COM SYSTEMS ENGINEER

Openings in Several Northeast Locations

Bell & Howell COM products has immediate requirements for systems engineers to provide technical support to our Computer Output Microfilm marketing effort in the Northeast area.

Experience should include successful systems design, commercial application programming, oral and written communications and direct customer interface. COM and mini-computer software experience is preferred. Responsibilities will include presales marketing support, customer training, software installation, and application analysis. Some travel required.

For immediate consideration, please send your resume including salary history (resumes without salary history will not be considered) to Mike Teague.

MICROIMAGERY GROUP
1451 Quail Street Newport Beach, California 92660

BELL & HOWELL

An Equal Opportunity Employer M/F

APPLICATIONS PROGRAMMER ANALYSTS

This is an opportunity for Programmer/Analysts with at least 1 year experience to become a part of a sophisticated large scale data processing environment which includes an Amdahl 470 and a Nationwide TP Network.

Your experience should include IBM 360 or 370 OS or VS, and competence in ANS COBOL and JCL. A plus will be experience with ASP, Panvalet, TSO, BAL, on-line systems, and data base management systems.

It will be beneficial if you have programmed for insurance, banking, or general business systems.

Our Springfield location combines an attractive combination of suburban living, recreational and cultural opportunities.

Interested candidates are invited to send a confidential resume including salary requirements to:

PAMELA BRODERICK
PERSONNEL DEPARTMENT

Massachusetts Mutual Life Insurance Company
1295 State Street
Springfield, Massachusetts 01111
An Equal Opportunity Employer M/F

New Careers in Software

San Francisco Peninsula

The creation of our new Software Technology Department in Special Programs Operation at Ford Aerospace and Communications Corporation has resulted in a need for a number of senior analysts or computer systems specialists. The individuals we are looking for will have advanced degrees and/or three years' experience in one or more of the following disciplines:

- Software engineering/software development methodology
- Data base management/distributed processing
- Image processing
- Minicomputer based systems (PDP-11, SEL 32, Eclipse)
- Computer networking/ARPANET protocols
- Microprocessor software development
- Operating systems (UNIX, RSX-11D)

We offer outstanding compensation and benefits packages, coupled with the opportunity and challenge of working in this new area. For immediate and confidential consideration, please forward resume and salary history to Professional Employment, Dept. JJL-13.

Ford Aerospace & Communications Corporation

Western Development Laboratories Division
3939 Fabian Way
Palo Alto, California 94303
An equal opportunity employer m f

EDP PROFESSIONALS

Make Your Future with the Leader

Through innovative problem solving, Datapoint Corporation has become the leader in a field we helped to create and develop . . . dispersed data processing. Datapoint can offer you a challenging and rewarding career with a company that recognizes and rewards demonstrated ability.

We have several immediate openings for highly qualified systems professionals who will be instrumental in the design and implementation of dispersed data processing systems for internal Datapoint use. These positions in the financial and manufacturing applications areas provide high corporate visibility and outstanding growth opportunities.

Systems Analysts (Project Leaders) Applicants must have six years in systems analysis and applications programming with at least two years heavy experience in systems design. Solid project control experience necessary.

Programmer Analysts Applicants must have three years in systems analysis and applications programming including one year of systems design.

All positions require a bachelors degree or equivalent/technical training. Minicomputer experience helpful but not essential. If you meet our requirements send your resume and salary history in confidence to **Mr. Don Warrington, Datapoint Corporation, 9735 Datapoint Drive, San Antonio, Texas 78284.**

An Affirmative Action Employer Committed to Equal Opportunity

DATAPOINT CORPORATION

The leader in dispersed data processing™

YOUR COMPUTER CAN'T FIND THE JOB FOR YOU. OURS CAN .

National Personnel Associates

**175 professional firms
in 130 metro areas**

**Dealy-Rourke
Personnel Service**
EDP Division
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Nashville, Tenn. 37203
(615) 329-1771

Availability, Inc.
Data Services Consultants
1300 N. Westshore Blvd.
Suite 130
Tampa, FL 33607
(813) 872-2631

Specialists in the placement of EDP Professionals.

Data General wants promotion copywriters.

Call Kevin Steele at (617) 485-9100. Data General Corp., Route 9, Southboro, MA 01772. An equal opportunity employer.

Data General

DATA PROCESSING OPENING

Manufacturing company in SW Ohio has opening for person with background of programmer/analyst and experience in 2 or more of —

RPG II
COBOL
DBMS "TOTAL"
IBM S/3-15 with CCP

Submit resume to: **YELLOW SPRINGS INSTRUMENT CO., INC.** Mrs. Naomi McKee, Per. Director P.O. Box 279 Yellow Springs, Ohio 45387

UNIVERSITY OF CALIFORNIA, DAVIS

Applications are invited for the ranks of Asst. or Assoc. Prof. to teach in a graduate program in Computing Science and to conduct applied research in medium and large scale Information Storage and Retrieval Systems. Applicants must have a Ph.D. or equivalent degree. The campus computing facility includes a Burroughs B6700 and associated distributed satellite systems. University of California is an equal employment opportunity and affirmative action employer. Position to start 9/77. Send resume or questions to Prof. Richard F. Walters, University of California, Davis, CA 95616, by Feb. 15, 1977.

SYSTEMS ANALYSTS APPLICATION PROGRAMMERS SYSTEMS (SOFTWARE) PROGRAMMERS

All levels of experience, including Project Managers. Starting salaries $13,500 to $26,000.

Companies pay all fees & expenses.

Resumes published under code numbers — no names. Our client firms are located nationwide and are engaged in every type business.

FREE — EDP OPPORTUNITIES BULLETIN, a representative list of our DP career opportunities, mailed free of charge upon request (HOME ADDRESS ONLY).

For further information on these and other positions, send your resume in strict confidence to:

Mark Fullar
Cadillac Associates, Inc.
32 W. Randolph St.
Chicago, IL 60601
(312) 346-9400

DATA PROCESSING

Expanding Mid-South mfr seeks skilled "pro" for lge 360/370 installation. Desirable city; excellent advancement potential!

Assn't MIS Mgr	**$20-24K**
Systems Analysts	**$18-20K**
Sr. Programmer, CICS	**$17-20K**

(Our staff knows of this ad)
Please reply in confidence to
CW Box 4850
797 Washington St.
Newton, Mass. 02160

COMPUTER SERVICES OPENING

AT
MICHIGAN TECHNOLOGICAL UNIVERSITY
ADMINISTRATIVE LEAD PROGRAMMER

Bachelor's degree preferred in Business Administration or Math/Computer Science, but will consider equivalent experience. Requires strong background on UNIVAC 1100 series with DMS-1100 and COBOL. 1100 Assembler desirable. Salary commensurate with experience.

Michigan Tech is a leading engineering university located in Michigan's Upper Peninsula at Houghton, Mich. The continued growth in our UNIVAC 1100 system has created the above opening.

**Contact: Michigan Technological University
Mr. V.L. Gigstad
Manager of Computer Services
Houghton, Michigan 49931**

*An Equal Opportunity Educational Institution/
Equal Opportunity Employer*

PROGRAMMER/ ANALYST SOUTHEAST - To $17,000

Due to continued growth, major nat'l corp seeks several Programmer/Analysts to work on strategic corp applications. Reqs min 2 yrs programming exp, preferably with large scale IBM equip & familiar with COBOL or ASSEMBLER Language. Excellent growth & employee benefits. All fees paid. For details contact Jim Schwab at (704) 527-4980 or send resume in conf to:

**FOX-MORRIS
PERSONNEL CONSULTANTS
4000 Park Road
Charlotte, NC 28209**

GECOS

If you are interested in relocating to the beautiful Pacific Northwest, we currently have several excellent positions for EDP professionals with GECOS internals experience.

System Software Mgr	to 30K
Systems Programmers	to 28K
Data Base Admin	to 28K

Contact Jim Morris or Bill Parfitt. Houser, Martin, Morris and Associates; 1621 114th S.E., Suite 219; Bellevue, WA 98004. (206) 455-9600

COMPUTER SYSTEMS ENGINEERS

We're seeking experienced computer professionals with backgrounds in the development of realtime minicomputer and/or micro-computer systems as applied to process control, data acquisition, and interactive graphics. A Bachelor's Degree is required with an M.S. in Computer Science or Electrical Engineering desired. A minimum of 2 years experience in software/hardware development on DEC and/or Data General mini-computers is desired.

Opportunity for professional advancement is excellent for those having good communication and leadership skills. The position offers challenging work in a diversified research laboratory environment. Battelle is a prime contractor for the U.S. ERDA and also performs contract research for other sponsors.

Send confidential resume including salary history to: E.P Galbraith.

Battelle
Pacific Northwest Laboratories
Battelle Boulevard
Richland, Washington 99352
An Equal Opportunity Employer

Programmer/ Analyst

Who is ready for

Management Consulting

International CPA firm seeks an ambitious, highly motivated specialist to develop its data processing practice in the Columbus, Ohio area. This is a rare opportunity for a self-starter who no longer feels challenged by present position. Business system design experience a must.

We offer outstanding opportunities to serve small, medium, and large clients in a consulting role. This person will play a key role in developing a new segment of the practice. Strong technical, communication and entrepreneurial skills a must.

Advancement opportunities are unlimited for those with proven abilities and who are strongly motivated to further their careers. We have an excellent program of continuing education to augment your personal growth.

Minimum of four years experience in data processing with strong secondary skills in financial planning or manufacturing management. An advanced degree preferred. Salary commensurate with education and experience.

Please submit resume and present salary level in confidence to:

CW Box 4858
797 Washington Street
Newton, MA 02160
An Equal Opportunity Employer

ASSISTANT PROGRAMMER

Leading investment banking firm (New York City) seeks Asst. Programmer for fixed income research (IBM 370VM).

Development of customer oriented problems + customer contact expected.

Math degree a plus. Wall St. background necessary; Bond experience preferred.

Salary commensurate with experience + exllent company benefits.

Write in confidence; must include salary history.

CW Box 4846
797 Washington St.
Newton, Mass. 02160

System Performance Analyst

Trans World Airlines, Kansas City, Missouri, is seeking a broadly experienced Data Processing professional with strong background in hardware, software, application planning and implementation. This is an exceptional opportunity for a senior level analyst to participate in equipment evaluation and selection and the performance tuning of multiple large scale 370/168 systems.

This position requires at least 6 years data processing experience, with 2 years in equipment evaluation and selection and 2 years using hardware/software performance measurement tools on large scale systems. Candidates must have knowledge and experience in system design, programming and teleprocessing is highly desirable. An undergraduate degree is required.

Please send resume and salary history in confidence to:

K.R. Garrett
Trans World Airlines
P.O. Box 20007
Kansas City, Missouri 64159
An equal opportunity/
affirmative action employer

PUT YOURSELF....
ON THE M-K FRONT LINE TEAM

In our 63 years of operation, Morrison-Knudson has completed thousands of engineering and construction projects of every type and size in every state in the union plus over 70 countries 'round the world. We have a big job for an experienced SYSTEMS-PROGRAMMER.

SYSTEMS-PROGRAMMER

Applicant must be qualified to develop, install and maintain systems software on IBM 370/158. A minimum of 2 years O.S. systems programming experience on large scale computing systems is required. Your knwoledge of VS1 internals is essential in this position. Expeience with VM, CMS, DOS/VS and VSAM is also highly desirable.

Salary range averages between 16-18K depending on experience.

Joining our team locates you in Boise, Idaho. One look and you'll feel you're in the nations second capital, with our capitol building and modern skyscrapers. But the comparison ends there. We enjoy "big city" living in a small town environment. Named "City of Trees," you'll be surrounded by some of the most beautiful national forests in the country — where you can enjoy all types of winter and summer sports in the smog-free mountain air.

Be a part of the M-K Front Line Team! Send your resume in confidence to: Barbara Herrison, Morrison-Knudson Company, P.O. Box 7808, Boise, Idaho 83729 or call (208) 336-2952.

MKO **MORRISON-KNUDSEN COMPANY**

An Equal Opportunity Employer M/F

COMPUTER PROGRAMMER

Large Chemical Company had need for an experienced Computer Programmer. Responsibilities will include writing, testing, debugging and implementing new programs and modifying existing programs. Minimum 2 years experience. IBM COBOL with OS-JCL. DL-1 and IMS a plus. Degree preferred. Send salary requirements and resume to:

Mgr. of Industrial Relations
Occidental Chemical Co.
P.O. Box 198
Lathrop, Calif. 95330
An Equal Opportunity Employer M/F

Systems Programmer Manager

Must be familiar with Burroughs 1700 equipment and Cobol or RPG II, be able to direct small programmer/analyst staff and schedule and control operations, communicate effectively with users, develop and integrate new applications, improve existing systems and use of equipment. Chicago area location. Salary mid 20's. Excellent benefits. Please send resume stating salary history.

CW Box 4855
797 Washington St.
Newton, Mass. 02160

COMPUTER SYSTEMS ANALYST OS INTERNALS

OPPORTUNITY:

- Responsible for systems support in a 360/50 installation.
- Develop ADP applications for on-line data base management system

REQUIREMENTS:

- Bachelor's or advanced degree in computer science or related field.
- OS, HASP, and data base management experience essential.
- NIPS experience desirable.

The University of California's Los Alamos Scientific Laboratory offers excellent working conditions and fringe benefits, including 24 days annual vacation, ample sick leave, and progressive retirement plant. Located high in the mountains of Northern New Mexico, the living is uncrowded, casual; the environment is pollution free; the climate is superb — cool summers and mild winters; recreational opportunities abound.

Please send complete resume or request application from:

R. Lynn Wilson, Recruiting Director
Division - 77-J
LOS ALAMOS SCIENTIFIC LABORATORY
P.O. Box 1663
Los Alamos, New Mexico 87545

los alamos
SCIENTIFIC LABORATORY

An Affirmative Action/Equal Opportunity Employer

U.S. Citizenship Required

DEC RSTS/E BASIC-Plus Programmers.

Opportunity to join fast-growing company in beautiful Pennsylvania. Positions require one year's design and programming experience in commercial area (Order Entry/Billing, Inventory Control, and Financial Applications). Challenging assignments with experienced software group. Send resume and salary requirements to:

CW Box 4853
797 Washington St.
Newton, Mass. 02160

COMPUTER SOFTWARE SPECIALIST (Senior)

Senior level position supervising a professional systems staff which is responsible for operating system (GCOS) communications software (GRTS), time-sharing, compilers, file and project control systems. Involves a large scale Honeywell 66/60 and mini-computer networks. Salary up to $21,000 commensurate with degree and experience.

Forward resume to David L. Nordlund, University of Kansas Computation Center, P.O. Drawer 2007, Lawrence, Kansas 66045 by December 27, 1976.

The Computation Center is an Equal Opportunity Employer. Qualified Men and Women of all Races are Encouraged to Apply.

HONEYWELL INTERNALS

Installation includes (2) H66/20 with a new system on order. 2 openings exist for Sr. software analyst to assume responsibility for analysis and upgrade of our operating system. Salary to $27K. Knowledge of H internals ie., GCOF, GMAP, or TDS for terminal support.

HARDWARE ANALYST

Manage small group involved in mainframe & terminal selection. Knowledge of CPU utilization, selection criteria, hdw selection & tradeoffs as well as vendor contract negotiation. Salary to $23K.

MALLORY DATA SYSTEMS AGENCY, Contact Mark Burn, 120 B'way, Suite 3114, New York, N.Y. 10005 (212) 964-2060.

PROGRAMMER

If you want to move rapidly and learn new techniques with broad exposure on many applications, join this growing service co. IBM COBOL, PL/1, and some mini experience. Not for career programmers! $25K. FEE PAID.

ROBERT HALF
PERSONNEL AGENCIES
522 Fifth Avenue
New York, NY 10036
(212) 221-6500

Programmer/ Programmer Analyst

Positions are now open for programmer analysts with strong COBOL and BAL backgrounds in the environment of enhancement, modifications, and maintenance of new and existing programs. Ability to interface with EDP users, develop specifications, and implement computer programs are required skills. IMS, PANVALET, and TSO are very desirable. Use of structured design and programming techniques is a goal for candidates.

Tektronix, Inc., develops, manufactures and markets internationally recognized precision electronic measurement instruments, computer peripherals and related electronic instrumentation. Located near Portland, Oregon, we are within a two hour drive of the Cascade Mountains or Ocean Beaches. The close-by nature playgrounds and the City of Portland provide a variety of recreational and cultural interests.

Salary is open. Benefits include liberal educational support, insurance and profit sharing programs.

Please send detailed resume and salary history to: Mary Walhood, TEKTRONIX, INC., P.O. Box 500, C7, Beaverton, OR 97077.

An Equal Opportunity Employer M F.

TEKTRONIX
committed to technical excellence

DIRECTOR, SYSTEMS DEVELOPMENT DATA BASE MANAGER

Our San Francisco Bay Area client is seeking two exceptional individuals to manage the design, development and implementation of large-scale, data base application systems. If you are ready for greater challenge and responsibility and possess most of the following criteria, then we would like to talk with you.

- Proven track record in managing a staff of data processing professionals who have developed and installed data base telecommunications systems which are successfully operational.
- Currently working in an IBM 370, OS/VS, IMS data base, structured programming environment.
- Heavy business operations and financial systems background.
- Demonstrated profit impact justification in project selection, priority and resource allocation determination.
- Strong leader, people motivator and effective communicator at all levels in the organization.
- Fundamental business knowledge and attitude. Good administrative ability, yet capable of leading a technical staff with confidence and stature.

This is an outstanding opportunity offering top-level direct compensation, and excellent fringes. Please forward resume and salary required to:

CW Box 4856
797 Washington St.
Newton, Mass. 02160

MANAGER
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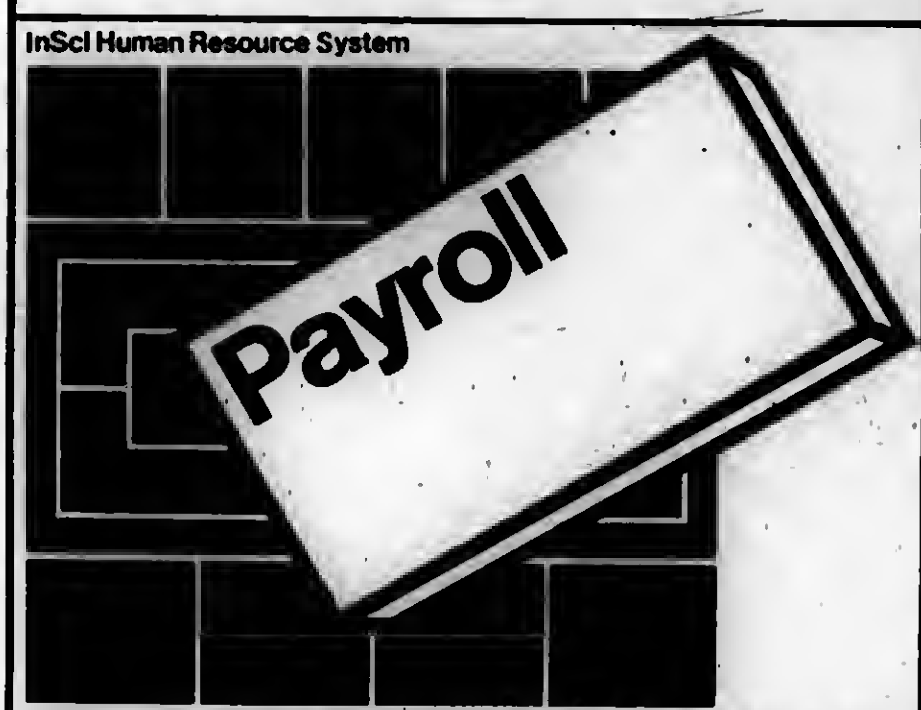

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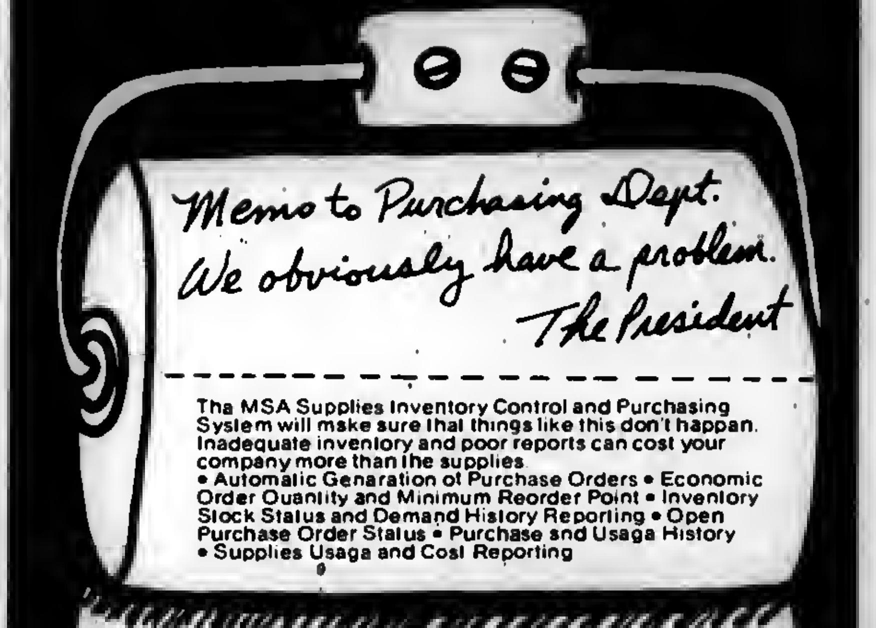
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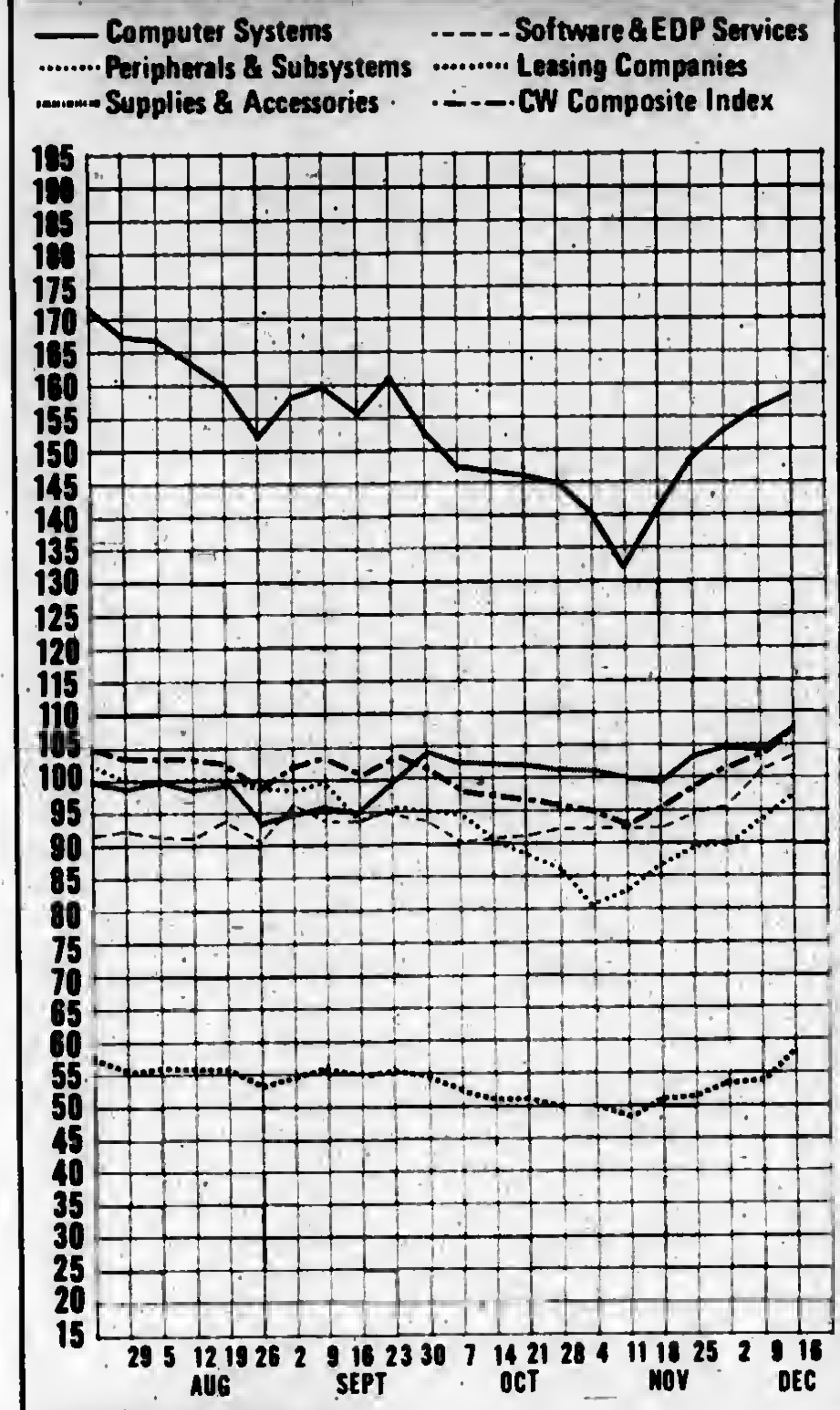

Earnings Reports

INFOREX

Three Months Ended Oct. 1

	1976	1975
Shr Ernd	$.24	$.11
Revenue	15,501,000	13,734,000
Tex Cred	275,000	.....
Earnings	708,000	313,000
9 Mo Shr	.53	.20
Revenue	45,684,000	41,462,000
Tex Cred	644,000	56,000
Earnings	1,560,000	564,000

ITEL

Three Months Ended Sept. 30

	1976	1975
Shr Ernd	$.60	$.41
Revenue	60,600,000	58,200,000
Earnings	3,900,000	2,700,000
9 Mo Shr	1.51	.93
Revenue	180,000,000	139,100,000
Earnings	9,900,000	6,500,000

KEYDATA

Year Ended July 31

	1976	1975
Shr Ernd	$.40	$.17
Revenue	14,878,000	13,478,000
Tax Cred	515,000	200,000
Earnings	1,102,000	452,000

LITRONIX

Three Months Ended Oct. 3

	1976	1975
Shr Ernd	$.10	$.12
Revenue	12,714,000	13,203,000
Earnings	239,000	294,000
9 Mo Shr	.....	.29
Revenue	34,026,000	36,666,000
Earnings	(4,276,000)	727,000

MARTIN MARIETTA

Three Months Ended Sept. 30

	1976	1975
Shr Ernd	$1.17	$.91
Revenue	323,221,000	290,113,000
Earnings	27,662,000	21,416,000
9 Mo Shr	2.55	1.76
Revenue	899,222,000	762,333,000
Earnings	60,211,000	e41,429,000

e-Includes $5,300,000 gain from real estate sale in lieu of condemnation.

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, DECEMBER 15, 1976

All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

COMRUTER SYSTEMS

ERCH		1976 RANGE (1)	CLOSE DEC 15 1976	WEER NET CHNGE	WEEK PCT CHNGE
O	AMOAHL CORP	23- 3T	36 1/4	+3 1/4	+9.8
N	BURROUGHS CORR	84-108	87 3/8	-1 5/8	-1.5
O	COMRUTER AUTOMATION	10- 19	17	- 1/2	-2.8
M	CONTROL OATA CORR	18- 2T	25 5/8	+1 7/8	+7.9
N	OATA GEMERAL CORP	40- 60	43 1/2	+ 5/8	+1.4
O	OATAPOINT CORR	24- 46	28 1/2	-5	-9.5
O	OIGITAL COMP CONTROL	2- 7	6 1/4	+ 1/8	+2.0
N	OIGITAL EOUIPNENT	46- 60	53	-1 1/8	-2.0
N	ELECTRONIC ASSOC.	2- 5	2 1/4	+ 1/8	+5.8
A	ELECTRONIC ENGINEER.	7- 16	8 1/4	+ 1/4	+3.1
O	FOUR-RHASE SYSTEMS	13- 21	16 5/8	- 1/4	-1.5
M	FOXBORO	28- 51	49 T/8	- 1/4	-0.4
O	GENERAL AUTOMATION	4- 11	T	+1	+16.6
O	GRI COMPUTER CORP	1- 1	1/2	0	0.0
M	HEWLETT-PACKARO CO	80-11T	86 3/4	-1 1/8	-1.2
M	MONEYWELL INC	34- 56	46 1/8	- 5/8	-1.5
N	IBM	22T-288	268 3/4	-4	-1.4
O	MANAGEMENT ASSIST	1- 9	7 5/8	- 3/4	-8.9
O	MEMOREX	17- 33	23 3/4	+2 1/2	+11.T
O	MICROOATA CORR	10- 28	16 T/8	0	0.0
O	MODULAR COMRUTER SYS	3- 14	5 1/4	+ 1/8	+2.4
M	NCR	24- 3T	36 1/8	+1	+2.8
O	RRIME COMPUTER INC	4- 18	17 1/4	+ 3/4	+4.5
N	PERRIN-ELMER	19- 27	19 5/8	-1 1/4	-5.9
N	RAYTHEOM CO.	45- 67	61 1/8	- 5/8	-1.0
N	SPERRY RAND	40- 52	46	+2 1/4	+5.1
O	SYCOR INC	9- 31	15	- 1/2	-3.T
A	SYSTEMS ENG. LABS.	5- 10	6	- 1/8	-2.0
N	VARIAN ASSOCIATES	12- 1T	14	- 1/8	-0.8
A	WANG LA3S.	11- 20	14 3/8	- 5/4	-4.9

LEASING CONPANIES

ERCH		1976 RANGE (1)	CLOSE DEC 15 1976	WEER NET CHNGE	WEEK PCT CHNGE
O	BOOTHE COMRUTER CORR	1- 8	7 1/2	0	0.0
O	COMOISCO INC	3- 10	9 1/4	+ 1/4	+2.7
A	COMMERCE GROUP CORR	2- 3	1 3/4	+ 1/8	+7.6
A	COMRUTER INVSTRS GRP	1- 5	1 7/8	0	0.0
M	OATRONIC RENTAL	1- 8	1	- 1/8	-11.1
A	OCL INC	1- 1	1	+ 5/8	+60.0
N	OPF INC	5- 8	7 1/8	0	0.0
N	ITEL	6- 15	13	+ 5/8	+5.0
N	LEASCO CORP	6- 20	18 3/8	-1 1/8	-5.T
O	LEASPAC CORP	0- 1	1/8	0	0.0
O	NRG INC	0- 1	1/8	0	0.0
A	RIONEER TEX CORR	6- 9	7 1/2	- 1/8	-1.6
N	U.S. LEASING	7- 12	10 1/8	+ 1/4	+2.5

ERCH: N=NEW YORR; A=ANERICAN; P=RHIL-BALT-WASH
L=NATIONAL; M=MIOWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BIO PRICES AS OF 5 X.M. OR LAST BIO
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ERCH		19T6 RANGE (1)	CLDSE OEC 15 1976	WEER NE7 CHNGE	WEEK XCT CHNGE
O	OATA ACCESS SYSTEMS	1- 5	4 1/4	0	0.0
O	OATA 100	6- 15	T 3/4	+1	+14.8
A	OATA PRODUCTS CORP	5- 15	12 1/4	0	0.0
O	OATA TECHNOLOGY	1- 2	2 3/8	+ 1/2	+26.6
O	OATUM INC	1- 2	1 1/4	+ 1/4	+25.0
O	OECISION OATA CONPUT	1- 4	2	+ 3/8	+23.0
O	OELTA OATA SYSTEMS	1- 1	1/2	0	0.0
M	ELECTRONIC M & M	1- 4	3 1/4	- 1/8	-3.T
O	FABRI-TEK	1- 1	3/4	-	-7.0
O	GEMERAL COMPUTER SYS	0- 2	5/8	+ 1/8	+50.0
N	HAZELTINE CORP	4- 12	9 3/8	+ 1/8	+1.3
N	HARRIS CORR	34- 57	5T 1/4	+1 1/8	+2.0
A	INCOTERN CORP	9- 20	12 3/4	-1 5/4	-12.0
O	INEOREX INC	3- 7	5 3/8	+1 1/8	+26.4
O	INEORMATION INTL INC	10- 18	11 T/8	- 1/8	-1.0
O	INTEL CORP	4T-109	54 1/2	-1 1/2	-2.6
A	LUNOY ELECTRONICS	3- T	3 T/8	0	0.0
O	MSI OATA CORR	5- 7	6 5/8	0	0.0
N	MILGO ELECTRONICS	15- 22	21 1/4	+ 1/2	+2.4
M	MOHAWK OATA SCI	5- 10	6 1/8	+ 1/4	+4.2
O	PENRIL CORR	1- 3	2	+ 1/8	+6.6
A	PERTEC CORP	3- 8	6 T/8	- 1/4	-5.5
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	RRECISION INST.	2- 10	1 1/2	- 1/2	-25.0
O	QUANTOR CORR	4- 6	5 1/8	- 1/2	-8.8
O	RECOGNITION EOUIR	6- 11	9 T/8	+ 5/8	+3.9
N	SANOERS ASSOCIATES	6- 11	10 1/4	+1 1/8	+12.3
O	SCAN OATA	1- 4	1 1/4	+ 1/8	+16.7
O	STORAGE TECHNOLOGY	9- 13	11 1/8	- 1/2	-4.3
O	T BAR INC	5- 10	T	+ 5/8	+9.8
O	TALLY CORR.	4- 6	5 7/8	+1 1/8	+23.6
O	TEC INC	3- 9	9	0	0.0
N	TERTRONIX INC	45- 69	65 1/4	+2 3/4	+4.3
N	TELER	2- 5	2 5/8	0	0.0
O	WANGCO INC	11- 22	18	- 1/2	-2.7
O	WILTEK INC	2- 2	1/2	0	0.0

SUPRLIES & ACCESSORIES

ERCH		19T6 RANGE (1)	CLDSE OEC 15 1976	WEER NE7 CHNGE	WEEK XCT CHNGE
O	AOVANCED SYSTENS INC	1- 4	3 1/4	0	0.0
O	BALTIMORE BUS FORNS	3- 5	3 1/4	- 1/8	-3.7
A	BARRY WRIGHT	6- 10	9 5/8	+ 3/8	+4.0
O	CYBERNATICS INC	0- 1	1/2	0	0.0
A	OATA DOCUMENTS	25- 45	45	+2 5/4	+6.5
O	DURLEX RROOUCTS INC	13- 24	13 3/4	+ 5/4	+5.7
N	ENNIS BUS. FORMS	6- 8	5 7/8	- 1/8	-2.0
O	GRAHAM MAGNETICS	8- 13	10	- 1/2	-4.7
O	GXAPHIC CONTROLS	15- 19	15	- 1/4	-1.6
M	3M COMPANY	55- 86	55 5/4	+ 1/2	+0.9
O	MOORE CORR LTO	32- 51	33 5/4	+ 5/4	+2.2
N	NASHUA CORP	11- 19	19 1/4	+1 1/4	+0.9
O	STANOARO REGISTER	15- 19	18 1/4	+ 3/4	+4.2
O	TAB PRODUCTS CO	5- 11	11	+1	+10.0
N	UARCO	19- 25	21 1/8	+ 5/4	+3.6
A	WABASH MAGNETICS	4- 11	10 7/8	+ 3/8	+3.5
N	WALLACE BUS EORMS	19- 25	21 1/4	- 1/2	-2.2

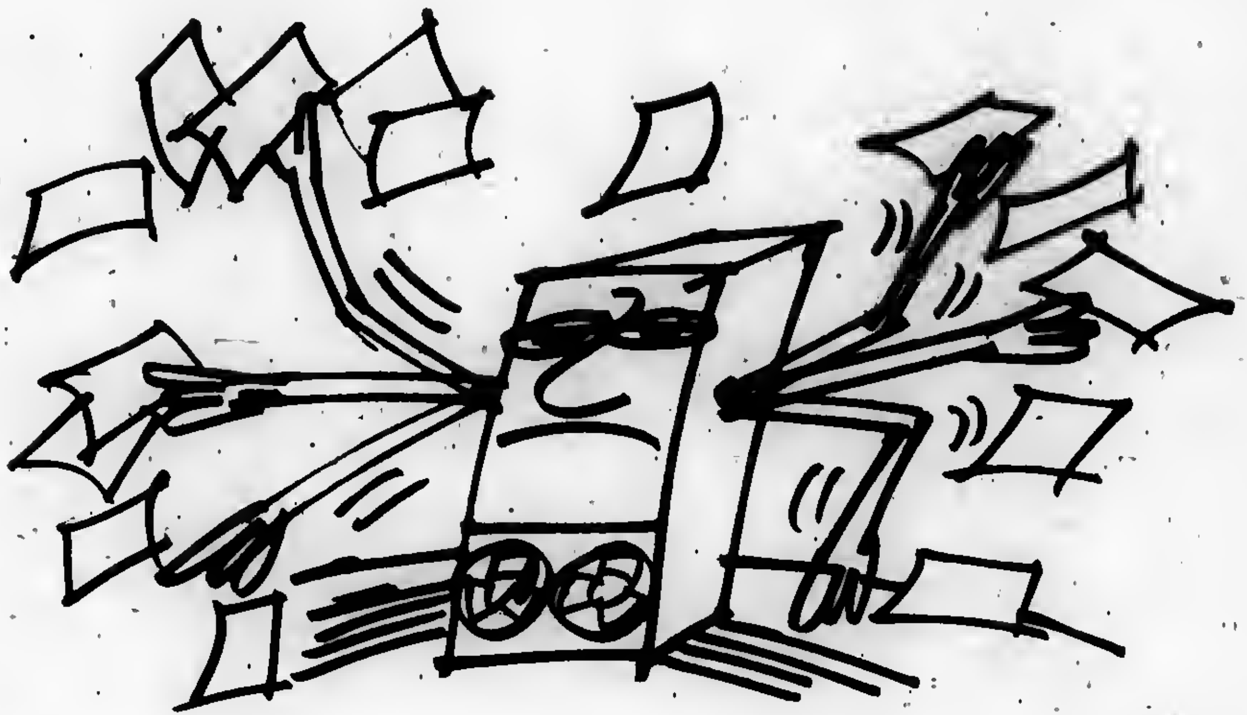
SOETWARE & EDX SERVICES

EXCH		1976 RANGE (1)	CLOSE DEC 15 19T6	WEER NET CHNGE	WEER PCT CHNGE
O	AOVANCEO COMP TECH	1- 3	1 1/8	- 1/8	-10.0
O	ANACOMP INC	6- 11	6 5/8	+ 1/4	+3.9
A	APRLIEO OATA RES.	2- 5	5	+ 3/8	+8.1
N	AUTOMATIC OATA PROC	1T- 35	29 7/8	- 1/2	-1.6
O	COLEMAN AMERICAN COS	2- 6	2 5/8	0	0.0
O	COMPU-SERV NETWORR	3- 10	8 1/4	- 1/4	-2.9
O	COMRUTER OINENSIONS	3- T	6 7/8	+ 1/2	+7.8
O	COMP ELECTION SYSTMS	5- 9	5 1/2	0	0.0
O	COMPUTER HORIZONS	1- 2	1 1/4	- 1/4	-16.6
O	COMPUTER NETWORK	2- 8	6 3/8	- 3/8	-5.5
N	COMPUTER SCIENCES	4- 8	7	- 1/8	-1.7
O	COMPUTER TASR GROUP	1- 2	1 1/4	0	0.0
O	COMRUTER USAGE	2- 6	2 1/2	0	0.0
O	CONSHARE	2- 9	5 1/2	- 1/2	-8.5
O	OATA OIMENSIONS INC	2- 5	5 1/8	+1 1/4	+32.2
O	OATATAB	1- 2	1 1/2	0	0.0
N	ELECTRONIC OATA SYS.	12- 18	16 1/2	+ 1/4	+1.5
O	INEONATIONAL INC	1- 1	1/8	0	0.0
O	INSYTE CORP	1- 5	2 5/8	+ 7/8	+50.0
O	IPS COMRUTER MARRET.	1- 2	1	0	0.0
O	REANE ASSOCIATES	2- 4	2 1/8	- 5/8	-15.0
O	REYOATA CORP	1- 5	1 5/8	0	0.0
O	LOGICON	3- 8	T 3/8	- 1/8	-1.6
A	MANAGEMENT.OATA	1- 3	2	0	0.0
A	NATIONAL CSS INC	13- 25	23	+2 1/4	+10.8
O	NATIONAL OATA CORR	4- 7	4 7/8	+ 1/8	+2.6
A	ON LINE SYSTENS INC	1T- 25	21 7/8	-1	-4.3
M	RLANNING RESEARCH	3- 5	3 5/8	0	0.0
O	RROGRAMMING & SYS	1- 1	1/4	0	0.0
O	RAPIDATA INC	2- 5	2 1/8	0	0.0
O	REYNOLDS & REYNOLD	13- 21	17 3/4	+ 5/4	+4.4
O	SCIENTIEIC COMPUTERS	1- 1	7/8	+ 1/8	+10.0
O	TYMSHARE INC	14- 28	17 3/4	- 1/2	-2.7
A	URS SYSTEMS	5- 5	5 T/8	0	0.0
N	WYLY CORP	1- 7	1 5/8	+ 1/4	+10.1

RERIPHERALS & SUBSYSTEMS

EXCH		1976 RANGE (1)	CLOSE DEC 15 19T6	WEER NET CHNGE	WEER PCT CHNGE
N	AOORESSOGRAPH-MULT	8- 15	12 1/4	+ 7/8	+7.6
O	ADVANCEO MEMORY SYS	4- 10	T 3/4	+ 1/8	+1.6
N	AMREX CORP	5- 10	7 1/4	+ 1/2	+7.4
O	ANOERSON JACOBSON	2- 4	5	+ 1/4	+9.0
O	ARRLIEO OIG OATA SYS	13- 25	16	- 1/4	-1.5
O	BEEHIVE MEOICAL ELEC	5- 11	10 T/8	+1 1/4	+12.9
A	BOLT,BERANER & NEW	7- 11	7 1/8	- 5/8	-8.0
N	BUNKER-RAMO	5- 10	8 3/4	+1 5/8	+18.6
A	CALCOMP	4- 7	4 1/4	+ 1/4	+6.2
O	CAMBRIOGE MEMORIES	0- 6	3/4	+ 3/8	+100.0
N	CENTRONICS OATA COMP	20- 56	26	+ T/8	+5.4
O	COOEX CORR	22- 42	31	-2	-6.0
O	COGNITRONICS	1- 1	7/8	0	0.0
O	COMPUTER COMMUN.	1- 6	4 1/2	- 1/8	-2.7
O	COMPUTER CONSOLES	4- 7	5 1/2	+ 1/4	+4.7
A	COMPUTER EOUIPNENT	1- 3	1 T/8	+ 1/4	+15.5
O	COMPUTER TRANSCEIVER	1- 3	5/8	0	0.0
O	COMTEN	4- 10	9 5/4	+1 1/8	+13.0
N	CONRAC CORX	20- 2T	26 5/8	+ 3/8	+1.4

Does your IBM host computer do too much telecommunications housekeeping and not enough computing?



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If your company is using a communications network, your host computer's applications growth is limited because of expanding workloads and lack of sufficient support.

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For these reasons, DPF introduces Flexicom.

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Flexicom's software frees your host computer of telecommunications housekeeping by organizing the network and placing tasks where they belong—with Flexicom. That's because it operates as a front-end *or* distributed processor.

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THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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Did Someone Lie To Make SSA Case For More DP?

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. — Someone in the Social Security Administration (SSA) deliberately misquoted utilization studies of that agency's computer operation in an effort to convince its commissioner and Congress that the SSA needed expanded DP facilities, the House Ways and Means Oversight Committee believes.

Utilization studies conducted by the General Accounting Office (GAO) and by an independent consultant using Boeing Computer Systems, Inc.'s Systems Analysis and Resource Accounting package during 1976 showed the SSA was making less than 50% effective use of its computer equipment.

Letters from SSA Commissioner James B. Cardwell to various congressional committees concerning the agency's plans to expand its operation with additional equipment and a new multimillion dollar computer facility left out important quotes from or references to these studies, according to William Vaughan, a subcommittee staff member.

Vaughan, who has just completed an analysis of letters by the commissioner to Congress, said he found the omissions "unconscionable." However, he said he believes Cardwell is "an honorable man" and suggested the problem rests with someone on the commissioner's staff.

By the time this story appears, Vaughan said, the subcommittee's chairman, Rep. Charles A. Vanik, will have addressed "a strong leter to the commissioner detailing these omissions and encouraging him to check with his staff on this matter."

This event capped a year of maneuvering by the SSA to add four IBM 370/168s to the 17 large-scale computer systems that now process most of its workload, to conduct a $2.3 million renovation of space in which to temporarily house these machines and to build what is now estimated by the General Services Administration (GSA) to be a $73 million computer facility in Woodlawn, Md. — all with a

(Continued on Page 4)

IBM a Client of Bell's Firm

Carter's Attorney General Choice Tied to IBM

By E. Drake Lundell Jr.
Of the CW Staff

ATLANTA — Griffin B. Bell, President-elect Jimmy Carter's choice for Attorney General, comes from a law firm that is presently doing work for IBM, raising the number of Cabinet appointees with IBM ties to four.

An IBMer had previously landed the nomination for the post of Secretary of State and, last week, Carter nominated people with IBM ties to be Secretary of Defense, Secretary of Housing and Urban Affairs and head of the Justice Department.

But the appointment to the Department of Justice was clearly the most sensitive since the department is in charge of prosecuting the government's massive antitrust suit against the firm.

Bell, a former judge on the Fifth District Court of Appeals in New Orleans, is a partner in the law firm of King and Spalding.

Another member of that firm is Charles Kirbo, who is probably the closest adviser to the President-elect. Kirbo, in fact, has been called "Mr. Carter's gray eminence" and has had a hand in all of the President-elect's Cabinet appointments so far.

King and Spalding represents many powerful business interests, including such firms as Coca-Cola and General Motors, and is known as a specialist in corporate legal affairs.

While the law firm is not on retainer, IBM has often used it to represent IBM on "routine commercial matters" in the Atlanta area, an IBM spokesman admitted last week.

King and Spalding is currently working on a case for IBM, the spokesman said, but he declined to divulge what that case involved.

However, the IBM spokesman claimed the work performed for IBM by King and Spalding was "not significant" and concerned such things as collections and bankruptcies.

In addition to Bell, Carter also named two others with close IBM ties as nominees for Cabinet positions last week.

As expected [CW, Dec. 13], he named Harold Brown, president of the California Institute of Technology, to be Secretary of Defense. Brown, a former Secretary of the Air Force and Director of Defense Research and Engineering, has been a director of IBM since 1972.

Brown has also been a delegate to the Strategic Arms Limitation Talks since 1969 and is a director of Schroders Ltd., The

(Continued on Page 6)

Chicago Company Charged

DP Implicated in $40 Million Fraud

By E. Drake Lundell Jr.
Of the CW Staff

CHICAGO — The DP manager and a programmer at Cenco, Inc. here have been charged — along with 17 others — in a $40 million fraud scheme in which the firm's computer system was allegedly used to cover the perpetrators' tracks.

Cenco inflated its inventory records in order to mislead potential stock purchases, the charges brought by the Securities and Exchange Commission (SEC) in U.S. District Court here indicated.

The 169-count complaint also accused the firm of using its computer system to inflate its 1973 revenues by about $2 million and employing other tactics to expand the scope of the fraud scheme to approximately $40 million.

While the complaint was unclear on how almost $28 million in nonexistent inventory got on Cenco's books — and into the computer system's records — it indicated the system played an integral part in the company's attempts to cover up that inflated inventory.

Those listed in the complaint were Cenco itself, a subsidiary of the company and 17 others, including Arthur Auman, who served as Cenco's DP manager, and Anthony Urso, who "had responsibility for programming the Cenco computer," according to the SEC filing.

Cenco, a corporation registered in Delaware, is engaged in the manufacture and distribution of services and products in the fields of health care, education, water pollution abatement and nursing homes.

The fraud was uncovered in 1975, according to the complaint, when the firm issued a press release indicating it would reduce its inventory by scrapping many items.

This was misleading and fraudulent, the complaint charged, because the inventory in question "did not exist" and "management was involved in a scheme to conceal the fact that the Cenco inventory had been massively inflated by the recording of inventory which did not exist."

But while the complaint was not clear on how so much nonexistent inventory got into the computer system records, it alleged that in 1973 and 1974 the inventory "was inflated by alteration of inventory tags used to record the physical count of inventory, alteration of computer listings generated to reflect the results of the physical count and

(Continued on Page 6)

Supreme Court Rejects AT&T Bid To End FCC Interconnect Control

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. — A final legal attempt by AT&T to challenge Federal Communications Commission (FCC) authority over interconnection has been rejected by the U.S. Supreme Court.

Specifically, the Supreme Court refused to review a ruling of the U.S. Fourth Circuit Court of Appeals special panel which decided the FCC had a right to determine what noncarrier equipment can be interconnected to the telephone network and what methods should be used.

The Supreme Court action culminated a long AT&T legal attempt to get jurisdiction of the interconnection question out of the FCC's hands and into the state regulatory commissions, where Bell felt it would get more consideration.

The legal proceeding was set in motion in 1973 when the North Carolina Utilities Commission said noncarrier equipment could not be interconnected with the telephone network within the state.

Independent equipment suppliers challenged this ruling with the basic claim that the phone net was an interstate resource and interconnection questions could be determined only at the FCC (and not the state) level.

In upholding the jurisdiction of the FCC, the Supreme Court may have speeded the finalization of the FCC's certification/registration program, which has been authorized by the commission to replace the Bell-fostered system of access arrangements.

AT&T and other segments of the tele-

(Continued on Page 4)

CDC Shuffles Prices On Systems, Services

MINNEAPOLIS — Control Data Corp. has adjusted lease, purchase and maintenance prices for new orders on selected equipment effective immediately.

Some purchase and lease prices for large-scale Cyber 170 systems were decreased by 6% while others were increased by 6%. Prices for peripheral equipment were also raised 6% while add-on memory for the 170 series was reportedly reduced in purchase price from 15% to 30%.

Domestic prices for computer services were hiked an average 8.5%; time and materials were raised an average 12.7% for "specialized consulting services."

Notice to Subscribers

This is *Computerworld's* annual combination issue. Coverage of the main events of 1976 begins on Page 2.

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A Look Back

Questions But No Decisions

Spotlight Rested on AT&T Future in '76

By Ronald A. Frank
Of the CW Staff

The year 1976 will go into history as one in which the future role of AT&T in the competitive world of telecommunications came under a sharp regulatory and legislative spotlight.

Although many questions were aired, few decisions were made, however.

In March the Bell System, with support from the rest of the telephone carrier industry, entered into the House of Representatives a bill called the Consumer Communications Reform Act. The proposed legislation was designed to cement Bell's position as a monopoly supplier and would have all but eliminated competition in the specialized carrier and interconnection areas so carefully nurtured by the Federal Communications Commission (FCC).

Some saw the Reform Act as a last-ditch attempt by Bell and its chief John deButts to appeal to Congress with a cause that had been rejected both by the FCC and in the courts. While deButts regarded the goals of the legislation as a type of manifest destiny, AT&T's many competitors saw the bill as a threat to their existence.

Bell launched an intensive effort to visit each member of Congress to solicit support for the measure. Many House members said they favored the bill only because they wanted a new look at the Communications Act of 1934, which had set up the FCC.

By year's end the House Subcommittee on Communications had held only three days of preliminary hearings and the bill died as Congress adjourned.

There was little doubt a similar proposal would be reintroduced early in 1977. Some felt Bell had opened up new areas that had escaped congressional scrutiny for many years. There was talk that some spin-off hearings might be held to determine the monopoly control and antitrust status of the Bell System.

Meanwhile, the so-called Phase II study of AT&T before the FCC included a February recommendation from an administrative law judge that Western Electric be divested by AT&T. No decision was reached by the FCC in the ongoing investigation into the reasonableness of AT&T rates.

And the Justice Department antitrust suit against AT&T which also sought to dilute Bell's vertical monopoly spent virtually the entire year trying to decide whether the U.S. Court in the District of Columbia or the FCC had jurisdiction to hear the case. As the year ended, the court finally decided it would hear the 1974 government suit, but no date was set for the start of discovery proceedings.

In August, the FCC reopened the Computer Inquiry with proposed definitions of communications processing that would allow AT&T and the other carriers to offer more services tailored to data communications users.

At an initial FCC briefing organized for the commission by the American Federation of Information Processing Societies, it became clear that defining the boundary between non-regulated DP and regulated data communications would be a long and difficult task.

Initial comments on the proposed new definitions are due early in 1977, but few expected a speedy FCC decision. As part of the Inquiry, the FCC agreed AT&T could tentatively tariff an interstate version of its Dataspeed 40/4 CRT.

The terminal was classed by competitors as a DP device which therefore should not be offered by a regulated carrier. But AT&T called it merely a device that had evolved from earlier Teletype models, ignoring the fact that it could be clustered and that it handled binary synchronous communications just like competing intelligent terminals.

The continuing effort to finally allow the direct connection of noncarrier (customer-provided) equipment to the telephone network continued around a steady stream of AT&T-fostered roadblocks. At year's end, however, few independent suppliers had become part of the FCC's certification/registration procedure, and most users still had their units connected via the extra-cost Data Access Arrangement.

IBM Asks Appeals Court to Nix Catamore Request for Rehearing

BOSTON — Catamore Enterprises, Inc.'s motion for a rehearing should be denied, IBM said recently in its response to the U.S. Court of Appeals for the First Circuit.

Although a jury awarded Catamore $11.4 million from IBM in a breach-of-contract suit, the appeals court vacated the decision and ordered a new trial [CW, Oct. 4]. Catamore asked the appeals court to reconsider its verdict [Oct. 25].

IBM's brief, submitted at the court's request, contained three allegations and refuted the user's charge of "invited error" — leading District Court Judge Raymond J. Pettine into issuing instructions to the jury which the appeals court found improper.

The Catamore brief contained many arguments not previously presented which are "therefore not deserving of consideration for the first time in a petition for rehearing," IBM stated.

The rest of Catamore's arguments, IBM claimed, "although sometimes camouflaged by different descriptions, have been previously presented, considered and rejected."

The day after IBM filed its reply, Catamore filed a motion to strike much of the contents of the IBM repsonse. This was countered by a motion from IBM to strike Catamore's move to strike.

Calcomp Winding Up Its Case

LOS ANGELES — California Computer Products, Inc.'s (Calcomp) portion of its antitrust case against IBM should conclude between Jan. 15 and Jan. 18, according to estimates from its lead attorney, Max Blecher.

Although some observers accustomed to the interminable timetable in the U.S. vs. IBM antitrust case expressed surprise at the shortness of the Calcomp trial, Blecher said he is running two weeks behind his estimates.

Beginning the week of Jan. 3, Blecher expects to introduce evidence, including IBM internal documents, on the plug-compatible portion of the case.

Jurors have heard three live witnesses testify on market share as well as excerpts of testimony from the U.S. case on the topics of market share, the competitive situation and fighting machines.

During the week of Dec. 20, Max Palevsky and Dan McGurk, formerly of Scientific Data Systems, testified on the difficulties of entering and being a force in the general-purpose systems arena.

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> "Developers of sort systems must be thoroughly familiar with the characteristics of the hardware of the sorting machine, they must be knowledgeable in program generation techniques, competent in program optimization and balancing methods, familiar with design technology and the operating system and I/O areas, as well as being competent sort specialists. In addition, since the performance of a sort is critical, a sort development team must be competent to undertake extensive prediction, analysis and test of their product's performance characteristics."

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*Volume Ten, Number Three, 1971.

The last time this happened, we matched our SyncSort III-and-half against the Hardware Manufacturer's SM1-5734 and SM1-5740 (PEER/ICEMAN).

Frankly, the results weren't even close, IBM sent its own MF-1 monitor to evaluate the tests, and a human observer to make certain that everything was according to Hoyle. But all to naught.

SyncSort performed better than the other two sorts in every category, as illustrated below:

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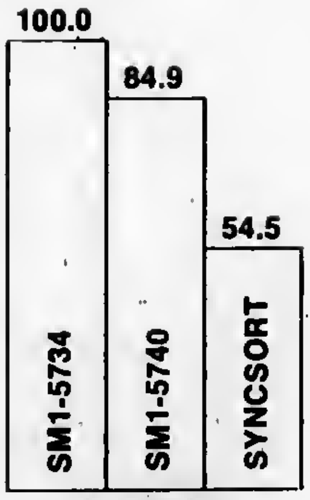
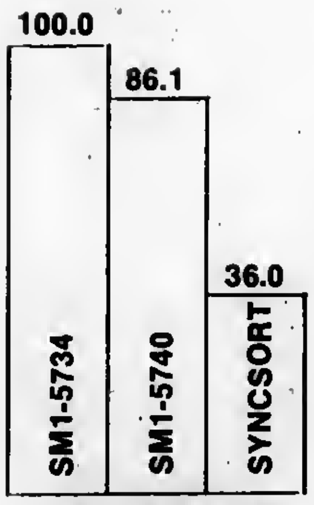
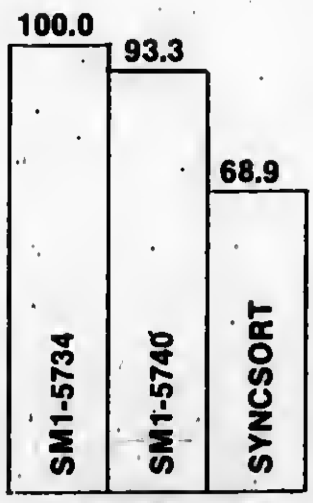


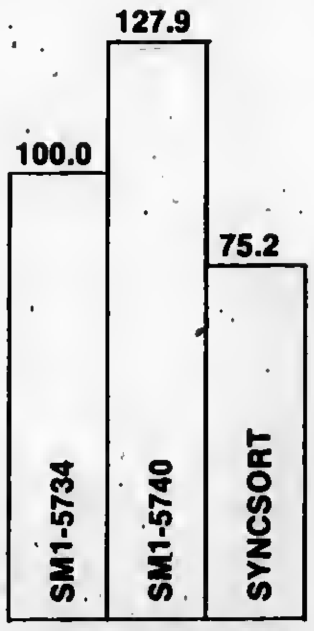
ELAPSED TIME



DISK KILOBYTE MINUTES



CHANNEL TIME



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Abuse of Studies Charged in SSA Expansion Plans

(Continued from Page 1)

minimum of interference from Congress.

Studies of the SSA's utilization of equipment it already had began in 1975 and continued throughout 1976 in response to charges from inside the agency and on Capitol Hill that the SSA didn't really need more machines or buildings.

The GAO stated its analysis "indicated the 15 systems examined were capable of supporting more than twice the largest identifiable workload processed by the agency."

In addition to these studies, congressional concern was raised through hearings by Vanik's subcommittee and by Rep. L.H. Fountain's Subcommittee on Intergovernmental Relations and Human Resources; awarding of the construction contracts was delayed 30 days.

Nevertheless, the SSA received approval on June 25 to go ahead with construction of its computer center from Robert E. Jones, chairman of the House Public Works and Transportation Committee.

Jones and his committee are "in the business of building buildings" and they believed SSA's stated need for additional facilities, Vaughan said.

"Fountain's and Vanik's subcommittees believed the GAO and its utilization report. And it wasn't up to Oversight to stop the contracts for the computer center or for Metro West," SSA's planned $96.7 million office building, he added.

Went Ahead With Plans

In the midst of this congressional face-off, SSA went ahead with its plans. On June 29, a $37.5 million construction contract was awarded to a three-firm consortium and ground was broken on the 34-acre site on Aug. 31.

In addition, the second half of the architectural phase of the plans for the computer facility is under way, according to a spokesman for the GSA, the agency handling the building's construction.

Throughout the fall and into the winter, the SSA renovated some 18,000 sq ft of space that will provide temporary housing for the four 168s.

The machines are now all in-house. Two of them began operation last Monday and the remaining two systems are scheduled to go up today, he added.

The SSA contracted with Mitre Corp. to further examine the agency's present utilization practices.

Begun in mid-November, this 15-month contract is intended to follow up on the GAO's study which the SSA called "only an indicator of possible underutilization of computer equipment," a Nov. 17 letter from U.S. Comptroller General Elmer B. Staats to Fountain noted.

The SSA also agreed it would "initiate no further significant computer acquisitions, including those proposed in the agency's 1977 budget, until the contract study is complete," according to the letter, which detailed the course of events since Fountain first asked the GAO to look into the SSA in July 1975.

Vaughan noted that if the SSA does try to acquire equipment before the Mitre study ends in fiscal 1978, Vanik will go to the House Appropriations Committee to stop this move until utilization is up over 50%.

The SSA also contracted with Dr. Herbert Maisel to develop the agency's staff. Maisel was previously director of the Academic Computation Center at Georgetown University and a former member of the team that studied SSA's Supplemental Security Income program and problems.

In addition to working to answer GAO criticisms of SSA staff problems, Maisel will serve as project officer for the Mitre project. He became a full-time SSA employee on Sept. 1, the GAO letter to Fountain reported.

The GAO noted SSA personnel had a habit of stopping the systems at shift changes. As of the end of June, the SSA initiated overlapping shifts for some 350 operations personnel to keep equipment running and to improve communications between employees on different shifts.

The GAO's contention throughout has been that the agency did not adequately evaluate the alternative of modifying and upgrading its existing facility, the letter said.

In August, the Council on Environmental Quality agreed with the GAO, stating "the modification of the existing computer facility was evidently a meaningful alternative that was not explored."

Vaughan considers the matter of the new computer center "a lost battle," but added "the war is continuing." The GAO stated that "since the construction contract for the agency's headquarters expansion project has been signed and site clearing for the computer center has begun, we plan no further work reviewing project alternatives."

AT&T Rebuffed in Bid To Limit FCC Power

(Continued from Page 1)

phone industry have stalled the introduction of this program with objections to several portions of it.

The AT&T fight against the interconnection of noncarrier equipment actually dates back to the first tariffs filed after the Carterfone decision which took effect in 1970. Bell initially claimed that harm would occur to the telephone network, but in various regulatory proceedings it was unable to convince the FCC that damages to the telephone facilities had actually occurred.

AT&T is now looking to Congress for assistance with its proposed Consumer Communications Reform Act, which would eliminate the interconnection of noncarrier equipment based primarily on economic grounds.

A spokesman for the Independent Data Communications Manufacturers Association said that organization is "pleased with the decision. This should put to rest the question of whether the states can promulgate divergent interconnection standards and thus retard technological advancement and economic growth."

An AT&T spokeswoman said "the decision not to review was not in the best interests of the American telephone user. At this point, we don't know what action we will take."

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U.S. vs. IBM Marked in '76 By More Speed, More Snafus

By Edith Holmes
Of the CW Staff

The Department of Justice still hasn't started playing the hare in its presentation of the government's antitrust suit against IBM, but at least it gave up the role of tortoise in 1976.

By this time next year, Judge David N. Edelstein should have heard all the evidence the Justice Department plans to present. And when year-end 1977 rolls around, the court may even have had a look at IBM's defense.

The Justice Department faces 1977 in the midst of attempting to prove its charges that IBM violated Section 2 of the Sherman Act by monopolizing and intending to monopolize the peripherals market. The new year will begin with 37 witnesses having taken the stand, nearly 35,000 pages of transcript making up the record and 226 trial days having come and gone.

Strength of Documents

In 1976, documents comprised the bulk of the government's case dealing with IBM's conduct in the marketplace. They also seemed to be the strength of the Justice Department contention that the corporation is a monopolist.

Between the opening of the trial in 1975 and this Dec. 2, the judge received 1,827 documents from the government, 740 from IBM and 22 from the parties together.

These documents, some 46 depositions also entered into evidence and the procedure which continued for the better part of the year — reading selected portions from these papers into the record — drove Edelstein from the courtroom in mid-July to the quiet of his chambers.

While the judge returned for live witnesses and while he halted these reading sessions at the end of the summer by permitting the court reporters to simply type all designated passages into the record, he continued to stay away when documents were described, offered as evidence and objected to. Much of the trial in recent months thus went on without his daily presence.

Lead IBM counsel Thomas D. Barr was also away from court in recent months. He obtained permission from Edelstein to be absent from the proceedings on a day-to-day basis to coordinate the private antitrust cases in Los Angeles with the government suit in New York and to manage IBM's claims of privilege for some 20,000 documents in the wake of a July ruling by the Second Circuit Court of Appeals that threw the question back to Edelstein.

Only lead government attorney Raymond M. Carlson remained in the courtroom virtually throughout the trial. He has frequently said he is eligible for retirement next November, however, so he may also exit the courtroom before very long.

Absent Principals

The absence of one or more of these principals from the daily trial reduced the number of peripheral skirmishes that diverted attention from the issues in this trial ever since it started. While fewer games were played by Edelstein, Barr and Carlson in 1976, however, waste of time and money was not lacking.

Barr took two occasions, for example, to say at some length that IBM would have stipulated between 75% and 95% of the testimony presented by the government. At the same time, when the Second Circuit ruled on the question of protection for IBM internal documents, Barr admitted to Edelstein and Carlson that 30% to 40% of the contested papers weren't privileged or were so old or of such little consequence that the Justice Department could have them.

Great hues and cries were also raised when the Justice Department used agents from the Federal Bureau of Investigation to interview IBM witnesses and when Edelstein upheld the government's right to do so.

Nor did the Justice Department look very good when it called seven IBM executives — including chairman of the board Frank T. Cary — to court to identify two documents and never had these men take the stand.

For its part, IBM organized an unfruitful trip to Florida for the parties and the judge to take the testimony of a retired IBM executive said to be unable to travel to New York. Incurring Edelstein's wrath by failing to complete the testimony, IBM will have to bring the executive to Foley Sq. anyway.

A Look Back

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COMPUTER ASSOCIATES

SEC Charges DP Played Role in $40 Million Fraud

(Continued from Page 1)

the preparation of bogus inventory tags which were inserted into the reporting system."

At the time, Cenco was carrying inventory valued at $40 million on its books.

In an attempt to determine how much of this inventory was actually real, the firm used its computer to compare the actual inventory with what was carried on the ledgers "and computer listings were generated reflecting this approximation." The listings revealed the inflated inventory exceeded the real inventory by about $28 million, the SEC said in its filing.

"Utilizing this information, a computer program was prepared which produced computer listings reflecting the determination of inventory items" which had been inflated, according to the complaint.

"Additional computer listings were prepared to be used in connection with a scheme to create the appearance that inventory which in fact did not exist had been physically destroyed pursuant to a well-organized and highly accurate destruction program," the complaint added.

Under the guise of destroying the nonexistent inventory, special computer codes were made up for the nonexistent stock, the SEC charged.

Some of the defendants went personally to various remote warehouses of the firm and ordered certain real inventory to be tagged with the numbers for the nonexistent inventory and then shipped to the central warehouse here in Chicago.

After the inventory arrived at the central warehouse, it was apparently retagged with real inventory numbers and then shipped back to the warehouses from which it had originated.

At the same time, the officers of the firm showed its accountants "documents which purported to reflect the results of a physical count of inventory items, the shipment of those items to a central site, the receipt of those items at a central site and the compacting, baling and removal of those items by scavenger services," according to complaint.

"These documents purported to substantiate the destruction of about $16.3 million of inventory . . . The documents were false."

In addition to the charges of covering up false inventory, the SEC complaint also indicated Cenco's computer system was used to inflate the firm's 1973 sales.

Cenco's "consolidated financial statements [for 1973] were materially false and misleading due to the inclusion of about $2 million of . . . sales which were false and constituted a duplicate recording of sales effected in the months of August and November 1972," according to the complaint.

To do this, "false sales listings were created, utilizing a special computer program which was designed to generate from the computer duplicates of portions of the August and November 1972 sales listings with changes made in the shipment dates," the complaint charged.

Bell's Firm Works On Cases for IBM

(Continued from Page 1)

Times Mirror Co. and Beckman Instruments. He is a fellow of the American Academy of Arts and Sciences.

Also last week, Carter named Patricia Roberts Harris, a black woman, to be the Secretary of Housing and Urban Development, although it had been widely rumored that she would land the Attorney General job.

A director of IBM since 1971, Harris is a partner in the Washington, D.C., law firm of Fried, Frank, Harris, Shriver & Kampelman.

Previously, she was an attorney in the Department of Justice, a dean of Howard University Law School and U.S. Ambassador to Luxembourg. She headed the credentials committee at the 1972 Democratic Convention and is a director of Chase Manhattan Bank, Georgetown University, Scott Paper Co. and the National Association for the Advancement of Colored People (NAACP) Legal Defense and Educational Fund.

Carter's earlier appointment with IBM ties was board member Cyrus R. Vance, named as Secretary of State designate. Vance is a partner in the New York law firm of Simpson Thacher & Bartlett and served as General Counsel and Deputy Secretary of the Defense Department as well as Secretary of the Army.

Vance, in addition to serving on the IBM board, is also on the boards of Pan American Airways, The One William Street Fund, Inc. and The New York Times Co. and is a fellow of Yale University.

He became an IBM director in 1969 and is president of the New York City Bar Association and chairman of the Rockefeller Foundation.

IBMers as Close Advisers

In addition to four people with IBM ties nominated to Cabinet positions — out of a possible 11 — other IBMers are also close advisers to the President-elect.

Irving Shapiro, chairman of E.I. du Pont de Nemours and Co., asked the President-elect not to nominate him as Secretary of the Treasury. Shapiro, an IBM director since 1974, is also president of the powerful business lobby in Washington, the Business Roundtable.

Although he declined an official post in the Administration, Shapiro still is a close adviser to the Carter camp on business issues.

Like Shapiro, another IBMer — former IBM Vice-President Jane Cahill Pfeiffer — asked the President-elect to remove her name from Cabinet consideration just at the time it was almost assured she would land the job as Secretary of Commerce [CW, Dec. 20].

Frank T. Cary, IBM chairman, has also met with the President-elect on matters of importance to the business community.

Another IBMer with the ear of the President-elect is Dr. Lewis A. Branscomb, IBM vice-president and chief scientist, who has been advising Carter on science and technology policy. He stands a good chance of being named science adviser to the President in the new Administration.

IBM last week said there was no requirement in the firm's bylaws forcing it to replace the board members if they do leave the IBM board of directors to take the Cabinet posts.

And in a personal note IBM Chairman Cary said "we are pleased that three members of our board, who have distinguished themselves in many endeavors, have been selected to serve in the new Cabinet. We wish them well."

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Privacy Protection in '76: A Hot Topic on Every Level

By Nancy French
Of the CW Staff

As the Privacy Protection Study Commission began to deliberate in 1976 over what steps private industry should be required to take to protect personal privacy, the spotlight focused on the actual practices of big business. It was not a pretty sight.

Under its glare, most companies found it difficult to conceal that many privacy abuses were the result of standard operating procedures rather than merely being "isolated incidents" of "computer errors."

At hearings at the end of February, witnesses for American Express, Sears Roebuck and Co. and the Bank of America testified they routinely provide information about customers' charge accounts to credit-reporting agencies, government agencies and even private attorneys without first informing their clients.

In many cases, that information was used by subunits of the firms that had shared it and by other retail or banking outlets to solicit customers for services and merchandise the customer never even expressed interest in obtaining.

Rejections for loans, which could be damaging to a person's credit reputation, could be "deduced" from a look at a credit-reporting agency's record on an individual, a bank executive told the commission, admitting that a bank's decision not to make a loan is often based on the bank's financial situation rather than the customer's.

Testimony also revealed thousands of individuals do not buy life insurance or take advantage of health insurance benefits for which they are entitled because they fear where information they provide will go.

Individuals who have filed claims to help pay for treatment of venereal disease, a heart attack or psychiatric counseling, for example, have found this information disseminated without their consent. As a result, many have lost seemingly unrelated privileges such as auto insurance.

Major Customers

It was also revealed that the Federal Government, unbeknown to the average citizen, is one of the major customers of the credit-reporting industry.

The Veterans Administration and the Civil Service Commission use credit-reporting agencies to verify claims and determine eligibility for benefits and suitability for security clearances.

The Federal Bureau of Investigation (FBI) and local law enforcement agencies use telephone toll records, credit investigatory reports and other credit information without court orders, according to Bella Abzug, who told the commission her information came from hearings conducted by the Government Operations Committee's Subcommittee on Government Information and Individual Rights.

Following these disclosures, many organizations hastened to announce policy changes to protect individual privacy that were widely reported in business news sections of the nation's newspapers.

The commission is nearing completion of its hearings on privacy abuses, but notably absent from its scrutiny have been privacy standards for criminal records as well as use of private information by labor unions, foreign governments and organized crime.

No progress was made on Capitol Hill on a law that would have provided protection for criminal records.

Faced with an uphill battle for reelection, Sen. John Tunney (D-Calif.) — , chairman of the Senate Subcommittee on Constitutional Rights, apparently placed his criminal records privacy bills on the back burner as a result of pressure from newspaper interests in his home district who believed such a law would limit their access to criminal data.

His defeat in the November elections by S.I. Hayakawa left up in the the air where that subject will go next year.

A Look Back

On a local level, law enforcement agencies moved to put into effect the privacy and security regulations issued by the Justice Department to fill the legislation gap.

One of Hottest Battles

And in Washington, a federally controlled computerized message-switching system, proposed by the FBI, stirred up one of the hottest battles of the year.

While the FBI lobbied within the Justice Department to get approval for the system from Attorney General Edward H. Levi, the White House Office of Telecommunications Policy, a number of congressmen and many local law enforcement officials battled against federal control of the communications network that would serve local police.

At year-end, Levi, by then a lame-duck Attorney General, had made no decision on the matter.

Privacy advocates were also active on the state level. The fruit of their work was seven fair information practices laws — most of which apply only to state agencies.

Minnesota, Massachusetts, Utah, Virginia, Connecticut, Arkansas and Ohio have laws, and California Gov. Jerry Brown recently issued an executive order with the power of law.

Though only two years ago the Privacy Act of 1974 permitted individuals to withhold the Social Security number if they chose to do so when doing business with a federal or state agency, the Tax Reform Act of 1976 gave back to the states the right to require that number for use in driver licensing, driver registrations, public assistance and parent locator programs.

In September 1977, the Privacy Protection Study Commission must recommend standards for personal recordkeeping in the private sector to Congress in a formal report.

Some believe the commission will ask for voluntary compliance or laws to correct abuses in specific areas rather than an omnibus act. This remains to be seen.

What is certain, however, is that existing legislation has not settled the question of who owns an individual's personal information — the individual or the organization that maintains it.

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A Look Back

Ruling on Programmers Kindles Debate on DP Professionalism

By Catherine Arnst
Of the CW Staff

In 1971, the U.S. Department of Labor decided programmers should not be considered professionals and thus should receive overtime pay under the Wage and Hour Laws [CW, Feb. 16, 1972].

In 1976, a federal court judge in Tennessee reaffirmed that programmers cannot be considered executive, administrative or professional personnel and therefore must be paid overtime [Feb. 9].

If a programmer is not a professional, then who in DP is? In 1976 that question eclipsed the previous year's licensing controversy, at least in the professional societies.

Last year at this time, Kenniston W. Lord Jr., then president of the Society of Certified Data Processors, claimed the licensing bill his organization had introduced "accomplished what we set out to accomplish" — draw attention to the need for a national set of standards directed toward the performance of DP people rather than systems [CW, Dec.31-Jan. 5].

"Licensing was never the issue; professionalism is the issue," he stressed.

In the court case in Tennessee, professionalism became a legal issue. During that trial Judge L. Clure Morton compared programmers to draftspeople.

"A draftsman is mechanical, he's covered by the Wage and Hour [Laws], even though he uses his mind, even though he points out where an architect makes mistakes [and] points out where the professional blew it," Morton said.

A programmer serves the same function, the judge said. "Of interest is the fact that a programmer does not need the expertise of the designer, need not know the inner workings of the computer and can do adequate work with only a general familiarity of its function and a grasp of computer language."

Dr. William H. Rowan Jr., a professor of systems and information sciences at Vanderbilt University, testified at the trial that programmers are professionals because they usually do a lot more than programming.

Rowan's criterion for a "DP professional" is someone who has completed a college-level computer science program that follows the 1968 guidelines issued by the Association of Computing Machinery.

Unlike the past, it is going to be very difficult from now on to acquire knowledge while moving up through the ranks, he said.

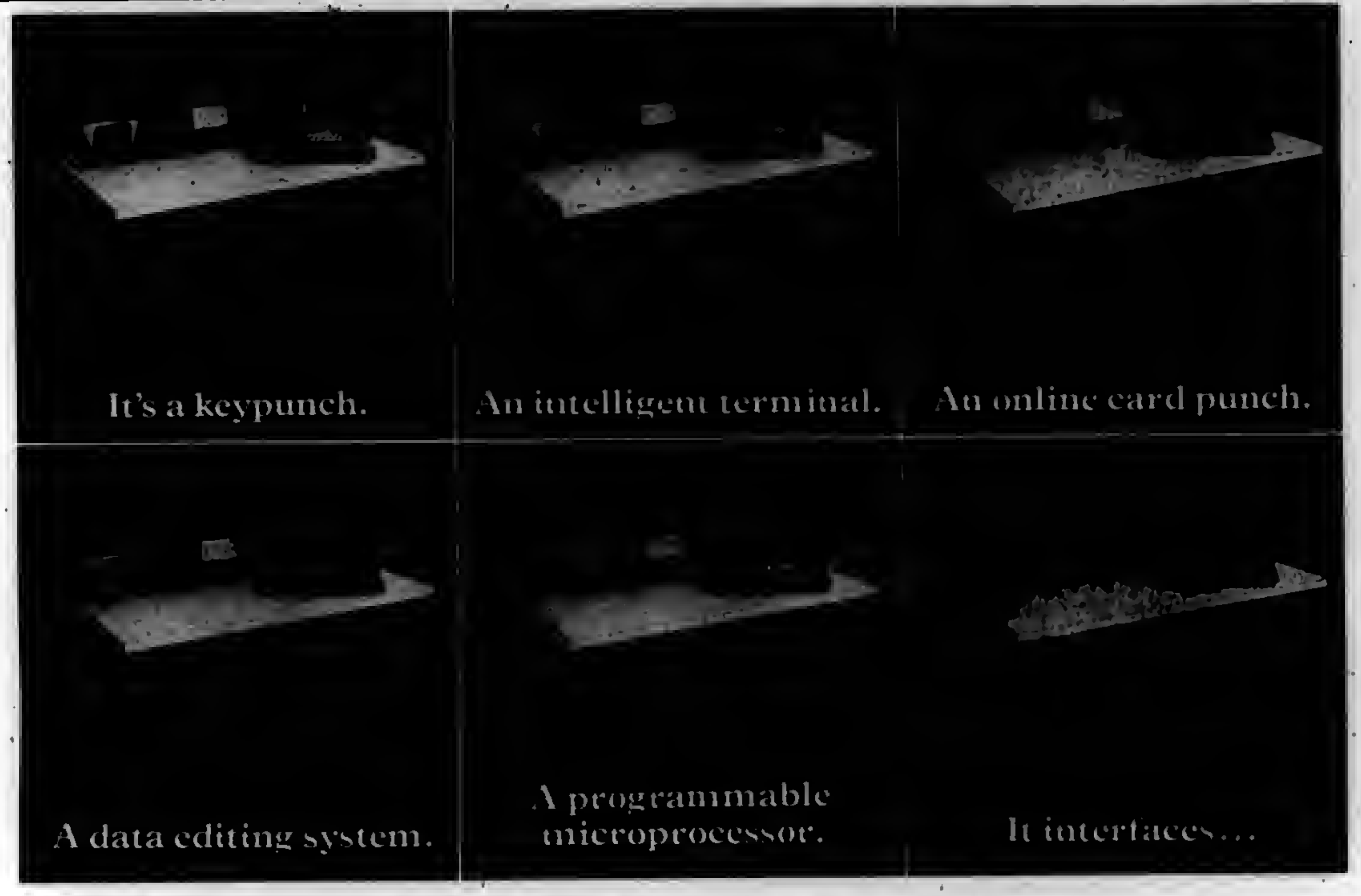
Professionalism is a major concern of both the Association of Computer Programmers and Analysts and the Institute for the Certification of Computer Professionals (ICCP).

Although a pure programmer is closely analogous to a draftsperson, according to Martin Morris, an officer of both those organizations, "in 10 years those types will be on the way out; there will be no programmer job title." The issue will then be moot.

The ICCP, which sponsors the Certificate in Data Processing (CDP) examination, is trying to address the "programmer as professional" question anyway with a CDP test for senior programmers [CW, Dec. 20].

The CDP test is normally aimed at DP managers, but the institute is venturing into the certification of programmers for 1977.

The professional societies are carrying the banner in the movement toward a definition of DP professionalism, but the rank and file are not very active or interested, Morris complained.



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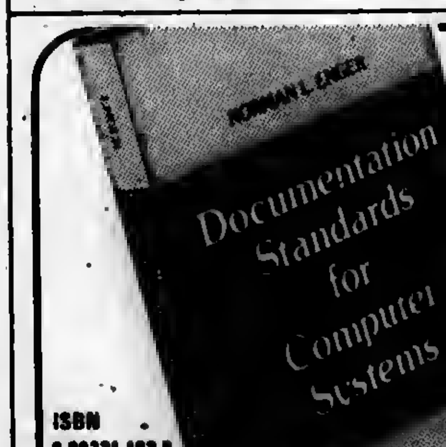

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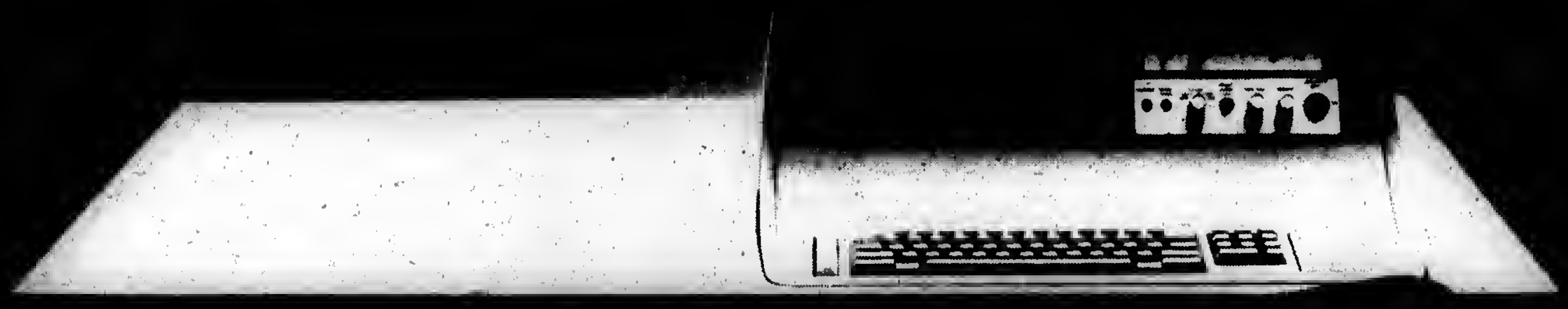

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A Look Back

Despite High Court Ruling

Program Patents Gaining Ground

By Don Leavitt
Of the CW Staff

Patents for deserving software seem to be more "acceptable" now than they were a year ago even though, at mid-year, the U.S. Supreme Court overturned a decision by the Court of Customs and Patent Appeals (CCPA) which had been in favor of a software "inventor."

In its reversal, the high court found the software "apparatus" for which Thomas R. Johnston sought a patent contained nothing that was not "obvious" from the prior art.

While attorneys may disagree with that decision, they generally agree the court did not challenge the CCPA's finding that software presented as "apparatus" is entitled to protection under the Patent Act if it meets all the usual challenges.

During November, the CCPA reiterated its basic contention that software is patentable and made the point doubly clear by reversing the U.S. Patent Office's appeals board on two separate and distinctly different cases on the same day.

Deliberate Double-Header

For inventor A. Michael Noll of Bell Labs, the CCPA ruled an improved raster scan computer graphics system was indeed new although the hardware involved was well known because the software behind the system was unique and unobvious.

Glen Chatfield won CCPA acceptance of his claims for the "Regulator" software which monitors and dynamically modifies the flow of application programs through a multiprogramming computer. The inventor's advocates successfully argued that Regulator provides a method or process of operating a computing system and is therefore patentable material.

The CCPA apparently was looking for just such a double-header covering both "apparatus" and "process" claims. The Noll application had been sent to the CCPA on Oct.1, 1973 and held, in the view of several observers, until just such a combination of claims could be decided at the same time.

Even the clerk's office at CCPA volunteered the thought recently that Noll's appeal had been held "an awfully long time" and such a delay was "certainly unusual."

Gamble for CCPA

The CCPA justices apparently wanted to get the Johnston case out of the way, even gambling that if it was appealed the Supreme Court might overrule them on "obviousness" but not disturb the basic finding that software couched in "apparatus" terms is patentable.

Once Chatfield's appeal came along and offered CCPA a strong case based on a "process" claim, the justices packaged it with Noll's and moved the pair to decision.

The vote in each case was 3-2 in favor of the inventor, but different groupings of the justices accounted for the tally in each case.

Dissenters Ask 'Higher Authority'

The court seemed rather more in agreement on Chatfield than the vote suggested. A "dissenting" opinion filed by two judges held no real disagreement with the majority decision.

Instead, it contained an appeal to a "higher authority than this court" to settle the question of patent protection for software so all concerned can move forward from a common base.

It is possible, observers feel, that CCPA Judge Giles Rich wrote his dissent just to provide the Patent Office with a vehicle by which it might seek a review of the case — and the basic problem — by the Supreme Court, the only body which he would recognize as a higher authority than his own court.

The Patent Office has not yet decided whether to seek such a review of either Noll or Chatfield by the Supreme Court.

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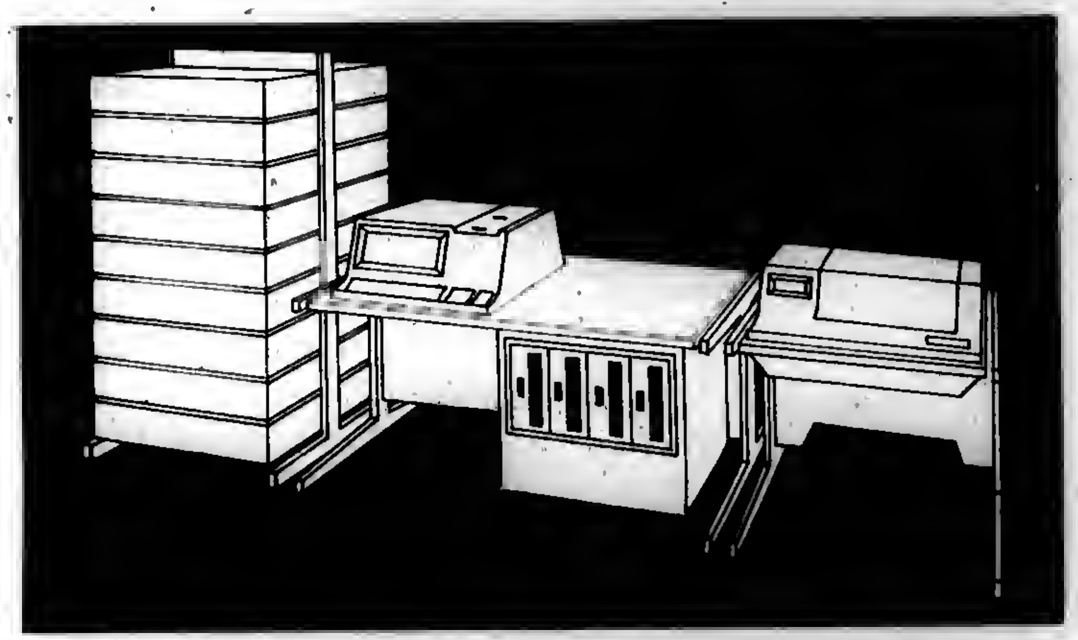

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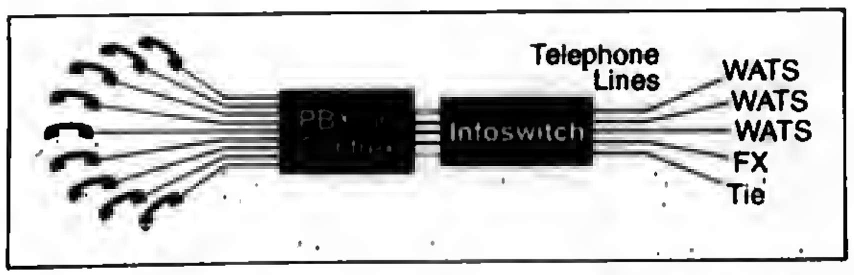

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Vendors Spent Hectic Year Reacting to IBM Price Acts

By Molly Upton
Of the CW Staff

IBM both raised and lowered its price umbrella in 1976, and other mainframers reacted in similar ways. The fallout to users was higher maintenance fees and reduced prices on mid-range CPUs.

IBM sounded the first salvo in late May with reductions ranging from 4% to 35% on various memories.

Amdahl Corp. was the only one to immediately pick up the challenge, and it reacted by slashing its memory prices as much as 38%. Amdahl also included a price hike on its CPUs, so the average price reduction was 5%, with greater reductions on systems with larger memories.

Early in July, IBM celebrated the Bicentennial Fourth by unveiling the 370/138 and 148, which represented significant price/performance improvement over the 370/135 and 145. For example, the purchase price of a 135 with 512K was $601,500, but a 1M-byte 138 cost $435,000.

In their retaliations, many mainframers said they could offer lower prices because of the use of 4K memory chips. But many in the industry could not help wondering if they would have been so quick to pass on those savings to the user if IBM hadn't provided the impetus.

Late in August, Univac dropped prices on its Series 90 machines. The 90/60 emerged as the warrior against the new 370 models; its memory capacity was increased and its price reduced.

A 512K-byte 90/60 that formerly had a $486,896 price tag was offered with a new 1M-byte memory capacity for $377,784, edging under the $435,000 IBM was charging for its 138.

In September, Burroughs cut main memory prices on its B2800, B3800 and B4800 by 19% to 37% on purchased memory and by 8% to 21% on leased modules. It also increased the memory capacity of its B2800 and B3800.

Honeywell Information Systems, Inc. (HIS) in early October said it had increased the performance of its Series 60/Level 66 batch-oriented mainframes with no increase in price. HIS also announced multiprocessor capabilities for the 66/05 through 66/80.

The price spread on 1M-byte systems by October was generally less than $100,000.

Other Price Changes

But CPU price changes, many of which were effected principally through lower memory prices, were not the only price actions during 1976.

IBM's Term Lease Plan cut monthly lease charges 9% below those of the Monthly Availability Charge.

Regarding maintenance, IBM was the first to announce price hikes, which it did in August. IBM said it would hike contract maintenance prices 5% to 15% on sold gear effective Nov. 16. In addition, it raised hourly service rates and systems engineering fees by 15% effective in August.

A Look Back

In September, HIS rallied with price hikes of 7% to 15% on its maintenance.

Univac indicated recently it will raise maintenance prices 5% to 15% principally on nonactive products, effective Jan. 1.

Hobbyists in Boston Getting Radio Show

CAMBRIDGE, Mass. — Computer hobbyists will take to the airwaves with their very own radio show beginning Jan. 22.

Believed to be the first radio series of its kind, "The Computer Program" will be broadcast on WBUR-FM, a noncommercial radio station with a 100-mile radius in the Boston area.

The format of the show will feature a guest who will speak on a topic of his choice and answer questions from listeners, according to Richard Gardner, host and originator of the show.

The program will also include news items of interest to the home computer hobbyist and a weekly announcement of resources related to the speaker's topic.

The program will be available to other stations and parts of each program can be broadcast as separate programs.

Further information can be obtained from Gardner at Box 134, Harvard Sq., Cambridge, Mass. 02138.

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Editorial

Legal Penalties

Many of the trends emerging in data processing are making it more and more inviting for computer-related crime to flourish.

As more valuable information finds its way into DP storage, the attractiveness of theft becomes a definable risk for the knowledgeable criminal. And as the potential rewards for unauthorized access of data go up, it is inevitable that organized crime will begin to examine the possibilities.

Cases such as the laundering of bad credit files by a ring of persons on the West Coast will soon become fumbling initial forays when seen in retrospect in a few years.

Just as bank embezzlers have been caught altering books, we may soon hear of multinational alterations in DP accounts that could cost corporations (and entire economies) huge sums.

These types of crimes will not have any James Bond blood and thunder associated with them. They will be accomplished by skilled DPers who have detailed systems expertise. And it is conceivable that some of these potential criminals will have helped to design security into the very systems that are violated.

As distributed DP concepts spread responsibility outward, the potential for compromise also increases. In such environments, the importance of security increases, too.

But warnings about DP security are nothing new to the DP industry and its users. The problem is that DP crime is still regarded by the rest of society and the legal system as an event that almost deserves envy.

There is little in the law about violating the rights of unsuspecting third parties with the unauthorized theft of DP information. Unauthorized access is even a difficult event to prosecute, depending on what is accessed and what is done with the information.

Perhaps it is time that a stronger legal deterrent be established against the violation of DP systems for unlawful gain. One of the major deterrents against homicide is that the punishment often exceeds the desire to commit the crime.

If we are sophisticated enough to breed experts on computer crime who study such things, we should also give some thought to setting up a proper framework of legal safeguards.

Taking such steps after a monumental DP crime has occurred will only show the present study of DP crime has been a futile effort.

Letters to the Editor

The Controversial Dead Horse Has Taken a Sufficient Beating

In regard to the current controversy over appropriate date conversion methods, I think the dead horse has taken a sufficient beating. I would prefer to look at the expression of a relative date in the same manner that Edsel Murphy used when expressing velocity.

To quote the publication "The Contributions of Edsel Murphy to the Understanding of the Behavior of Inanimate Objects" under Section II (General Engineering):

"Dimensions will always be expressed in the least usable term. Velocity, for example, will be expressed in furlongs per fortnight."

Perhaps the American National Standards Institute could be coerced into developing such a method of measuring time.

Greg Faubert

Detroit, Mich.

Correction of First Impression

In the article covering my talk at Las Vegas ["IBM-Amdahl Pact Has User Implications," CW, Nov. 8], I was reported as saying the cross-license agreement with IBM would provide a measure of protection.

Perhaps I did not state the value of the cross-license agreement properly. The agreement in fact provides a measure of protection for Amdahl users in that IBM patents for its future systems could not prevent Amdahl from producing a compatible system.

With respect to the item on "stymieing court action," I do not recall making such a statement in the context of a patent cross-license agreement, but rather with respect to a question about IBM taking specific actions to quash Amdahl's business activities.

Gene M. Amdahl
Chairman

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Sunnyvale, Calif.

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In his letter [CW, Dec. 13], Stuart R. Sheedy sug-
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Stephen E. Wright

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Clarifying the Point

The Nov. 22 issue contained an article with my byline. This article had a misquote in it.

It stated Entrex and Keydata could not keep up with the speed required by our firm. In the original article I sent to *Computerworld*, neither vendor's name was mentioned.

The statement was to the effect that Entrex and Keydata could not guarantee they could keep up with the speed required. This has caused us consternation, as well as Entrex and Keydata.

Alan W. Hawkins
Director of DP

McKee Baking Co.
Collegedale, Tenn.

(Other letters on Page 18)

Computerworld welcomes comments from its readers. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

Data Past

Five Years Ago
Dec. 29-Jan. 5, 1972

WASHINGTON, D.C. — The Federal Communications Commission (FCC) told AT&T to justify the need for Direct Access Arrangement (DAA) interconnection devices. The DAAs were branded "discriminatory" by the Independent Data Communications Manufacturers Association.

The association, in an informal complaint to the FCC, charged the DAAs discriminated against users who provided their own modems and other noncarrier equipment.

The FCC indicated that unless some DAA requirements were shown to be technically necessary, the commission would take action in the public interest.

Eight Years Ago
Jan. 1-8, 1969

WASHINGTON, D.C. — A precompiler written in Cobol was released in conjunction with the Navy standards test program for compilers. The precompiler saved users both computer time and money by reducing the number of compilations necessary to complete a Cobol program. The predicted effect of such compilers was improvement of the overall working efficiency of the programming industry without sacrificing needed machine and man time.

— — —

SANTA ANA, Calif. — A remote terminal system was announced by Data Computer Systems. The unit, "the first fourth-generation remote communication terminal," provided remote capabilities for keyboards, card readers, printers and punches over voice-grade lines.

The system, called the CP-4, could be interfaced to any standard modem, provided operating speeds up to 240,000 bit/sec and operated with line printers at 315 line/min.

The price of the system ranged from $29,000 to $42,500.

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Reader Commentary

Citibank's Minicomputer Approach Seems to Be Working

By Joseph T. Rigo

Special to Computerworld

We have all heard about Citibank's massive conversion to minicomputers. We are now beginning to hear the rest of the story and it involves a lot more than hardware.

In somewhat oversimplified form, the current situation was recently described like this:

- Citibank, one of the world's largest corporations, is junking all its big IBM mainframes.
- It is replacing its big machines with minis – dozens of them, of every make and model.
- It has drastically reduced its permanent systems and programming staff. For new development, it rents consultants for as long or short a time as needed.
- It used to take two to five years to design and implement a new system. Now the bank is getting the job done in as little as six weeks.

Approach Working

The important thing about all of this is that it seems to be working. It is not an experiment any more. The bank clearly feels its approach is paying off in cold, hard, business terms.

R. Max Gould, a Citibank vice-president, described the bank's current approach to DP at a recent Association for Computing Machinery (ACM) meeting in New York.

The impressive thing about his talk was that he made everything seem so logical. It came across as the only sensible way to do the job. He left little doubt that this is the way we are all going to be working in the future.

There is only one catch. Before we can follow the new Citibank approach, we are going to have to learn how to do things the way Citibank was doing them five years ago.

That's where most of us are now. We are learning to work with multiphase life cycles.

Every company has its own version of the life cycle, but they all have a few things in common. They break the long development process into manageable chunks. They also keep an eager development team from taking shortcuts that lead to disaster.

Citibank mastered the life cycle. In doing so, it found out where it was safe to take shortcuts. It found out which projects need all the administrative bells and whistles and which ones should be left alone.

It appears that Citibank's new approach was in response to several factors:

- Systems were coming in more or less on time and within budget, but the designs were two years out of date. The world had changed while the system was being developed.
- The centralized staff was under pressure from the users who wanted greater control over their own systems.
- New technology – the mini – made major change possible.

As Gould described it, things are now somewhat as follows:

The entire corporation has organized itself into separate groups for different types of customers. There are groups for the petrochemical industry, the real estate industry, retail consumers, etc..

Each group has, in effect, its own DP department. A group manager can buy his own computer, rent his own consultants and develop his own systems.

The manager of a group has the burden of proving that his great new system is cost-justified. In addition, the surviving systems people at the corporate level have to prove that the bank's overall approach to DP is cost-justified.

Yes, they recognize that a dozen different groups may be developing essentially identical systems. And, yes, they know there will be a failure every now and then.

Within limits, they don't care. They argue that the total cost for a complete minisystem is so small that they can lose a few, and it's still cheaper than doing things the old way.

Gould functions as a chief internal consultant. He and his staff work with the group managers. He recommends consultants and design ideas. He gives guided tours of a room filled with different types of minis to help the manager select one for his own application.

Gould spends most of his time with big projects. These include applications such as funds transfer. They will be implemented by consultants on minis, but they still must adhere to all the life cycle paperwork.

He gives a little time to medium-size projects. As the classification suggests, these projects are exempt from some of the life cycle controls. But they represent sufficient risk to the bank that they require some corporate attention.

For a small system, the group manager has a completely free hand. In fact, he may have trouble getting attention even if he wants it.

Basically, Citibank is betting that its group vice-presidents are at least as smart as the guy who owns the candy store in the lobby. If the candy store owner can have a mini for his accounts receivable, so can the head of a major division of a multinational corporation.

Gould's talk was to the New York City Chapter of the ACM Special Interest Group for Systems Documentation. So, naturally the question of documentation came up. It came as no surprise that Citibank has disposed of most of it.

- Most new systems are terminal-oriented, so user documentation is built into the system as much as possible. Information is displayed at the terminal when needed.
- The computer operator gets whatever run documentation is needed.
- The biggest emphasis is on preparation of a thorough functional specification. It describes the user's requirements and it goes on to include program specifications.

Gould said he is currently preparing a standards manual. It will supply the minimum guidance necessary for consistency within the corporation.

There is some program documentation, he said. But he indicated that if maintenance becomes a problem, it may be cheaper to call the consultants back to build a new system.

One of the most impressive things about Gould's case was the way he presented it. There were about 50 people present and they maintained a constant stream of questions. In fact, it was more like a press conference than a speech.

Many of the questions were downright hostile, but Gould fielded all of them with good humor.

This was not a person who was nervously defending an interesting new theory. He was on rock-solid ground and he knew it. He was graciously telling us about how his company is doing things these days. We could listen or not.

Anyone want to buy a slightly-used ten-phase development life cycle?

Rigo is president of Sysdoc, Inc. in New York City.

Dangers of Using Data Base Files Must Be Identified

The Taylor Report

By

Alan Taylor, CDP

Two columns recently dealt with the problems of data base files – the first gave the theory that there are specialized problems and the second cited a specific case, the distribution of Master Charge Checks by Shawmut Bank in Boston.

Judging by the response, it seems that what actually happened to the data file in the Shawmut case is still not clear – so let's take another look at it.

On the surface, a book of "negotiable instruments" (i.e., checks) was sent unrequested and unannounced by ordinary mail, to a former Shawmut Master Charge user. This happened despite the standard banking practice that such documents are considered security paper and are only to be handled with easy audit trails that are able to pinpoint who is in possession of the checks.

The Basic Problem

The data file record was composed of many fields, but we only need to concern ourselves with the following:

- Name: T.K. Christo
- Address: 36 Beacon St., Boston, Mass.
- Customer closed account?: (Nonexistent field).
- Date of last activity: June 1976

Of these three fields, what can we see that can lead to a security breach?

False data is the basic problem of all data base data file operations. The key question is: Which field is vulnerable to have false data? Unless a clear answer of "none" can be given, the file itself can forestall unexpected problems that have nothing to do with the programming or design of the programs that access it.

In this case, our old friend Gigo has raised its ugly head again – with the very computer file in our own data base being the Garbage In part.

Clearly, the name field will normally be correct. A marriage change, for example, may make a different name equally valid or even preferable, but the name shown in the file will still be usable.

'Halo' Effect

The address field is a different kettle of fish altogether. True, there is a "halo" effect at the time of an address change which sees to it that mail is passed forward sooner or later. But at best, this address-change halo only lasts about five or six weeks – long enough for the first monthly bills to be forwarded and the change to get reported for active accounts, but not long enough to cover nonactivity between June and November under any circumstances.

The address field – not the name field – is what should have been noted as being vulnerable in the Shawmut files. And this is what seems not to have been realized, when people objected that there was nothing wrong with sending the checks to former cardholders.

In this case, the checks were sent to an obsolete address and that is the problem. The address in the Shawmut files is, in fact, only as good as the latest activity date.

Shawmut used required addresses that were correct to within the halo period – certainly to within two months in the case of canceled memberships. The risk of using less-accurate data was that the checks would be dispatched in easy-to-identify envelopes to addresses which may or may not be correct.

In any case where the address was not correct, there was no way in which the system would be self-correcting. Unlike statements which when missing sooner or later make the cardholder and/or the bank suspicious, missing distributed checkbooks don't call for any immediate action on either side. The bank doesn't expect all its cardholders to use them, so nonactivity gives no information. The recipient doesn't expect to receive them, so nonreceipt raises no questions.

Hence, the stage is set for real, or hoax, interception of the checks because of the failure of the data base address field to contain known-valid information.

Who's at Fault?

Now, of course, the programmer who specified the mailing program could have corrected it. He could have specified that the file should look at the last activity, and if this was longer than two months, it should be eliminated from review.

I don't think this was practical; the number of eliminated cases would have been too large. This is a typical hindsight alibi. Where the data file is incomplete and does not record a customer's notifications of account closing, I don't see anything that the application programmer can do.

What he needs is some way of knowing what the fields really are giving him before he can be saddled with the responsibility for writing the applications that use the data base properly. If he had known the addresses could be months out-of-date yet still went ahead and sent out the checkbooks then it would have been his fault. But I don't believe for a moment that this information was brought to his attention during the development of the mailing program.

Nor do I believe the programmers and analysts who originally described the files were at fault in failing to include fields beyond those that they needed to handle their own applications. They did not need to consider obsolete addresses or customer closings – these were self-correcting situations. There is little chance that one of their tasks would be to foresee that someone might sometime use the data base file for some other activity that made this important. So they, too, must be held faultless.

The problem of vulnerable data is simply and solely that of the data base concept itself. It is, therefore, the responsibility of the data base people to set things right – not to push the problem and the associated costs onto the data base users or the data base file providers. This is a data base problem which is too often not recognized as such.

Suggestions, Anyone?

Is there a solution? I think so and I referenced one in another column when I talked about the missing three-letter word that we may have to add to our vocabulary so as to handle the situation.

Again, I don't have any space to write about this particular solution now. So, if any of you have solutions that you would like to suggest or any other comments on the matter, I'd be pleased to hear of them.

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Letters to the Editor

Rigo Very Far Off Base; Van Duyn Right On Target

For the past year or so, I've been reading articles by Joseph Rigo relating to what it takes to be an effective documentation specialist in the computer field.

Having personally been in the computer and documentation fields for nearly 20 years, I marveled at how someone could speak so positively and with such authority on the subject and be so far off base with what the problems and solutions of technical documentation really are.

At one point I attempted to correct some of his wrong information by writing an article on documentation [CW, April 12], hoping to present some of the real problems that a technical writer encounters. But Rigo's articles continued to appear regularly.

It was with special delight that I read Julia Van Duyn's article ["Glibness Called No Way to Help Novice Tech Writer," CW, Dec. 6]. I agree with most of her ideas on technical documentation and wholeheartedly agree with her observations of Joseph Rigo.

Hopefully, where I failed, by my article, to curtail Rigo and establish a meaningful level of discussion on technical documentation, maybe Van Duyn's more direct approach will succeed. I certainly hope so.

Harold Schmardebeck

Springdale, Ohio

Cobol Structures Deficient

I agree completely with Larry Kintisch [CW, Dec. 6] about the desirability of in-line block structures in Cobol. Top-down, structured or goal-directed programming requires a language which supports completely nestable block-oriented control structures.

Although Cobol gives the appearance of having the necessary structures, they are deficient primarily because of a complete lack of statement bracketing facilities (i.e., the DO-ENDDO to which Kintisch referred).

In a true block-structured language, any "block" (e.g. a single statement) can be replaced by any other block (e.g. "if condition then statement1 else statement2") at any level of nesting without disturbing the surrounding code. This is where the true payoff begins – in terms of reduced maintenance costs.

The control structures which make this possible for Cobol programmers are available; they are implemented through the Scobol preprocessor which translates a program written in Scobol into a semantically equivalent Cobol program.

The extended control structures provided by Scobol include WHILE-DO-ENDDO, ITERATE UNTIL-ENDITER, REPEAT-UNTIL, IF-THEN-ELSE-ENDIF, SELECT CASE-ENDCASE, POSIT-ADMIT-ENDPOSIT and QUIT BLOCK.

The precompiler is itself written in Scobol (and in the resulting Cobol) and can be implemented on any system with an ANS Cobol compiler.

For additional information, write to me at Software Consulting Services, 901 Whittier Drive, Allentown, Pa. 18103.

Martha J. Cichelli

Allentown, Pa.

Always on a Sunday

In response to James Hammill's question [CW, Dec. 6] concerning a method for figuring out what date Easter will fall on for the 10,000-year interval beginning with the year 0000, we cannot divulge the method or the date but we are at liberty to announce our computer's finding for that day to be Sunday.

Steve Ferin

Cedar Rapids, Iowa

Time-Tested Technique

To supplement the interesting article by Peter F. Klammer and the letter from Joseph W. Begasse [CW, Nov. 22], the Julian day and system were not named in connection with the Julian calendar, but were named by its progenitor, Joseph Justus Scaliger (1540-1609) in honor of his scholar father, Julius Caesár Scaliger (1484-1558).

And to further confuse, the Julian day commences at noon. Byte that and work it into your DP system. How about starting with 4004 B.C., which Bishop Ussher claimed was the date of the creation (not to overlook William Jennings Bryan).

Further, somewhere between 4 B.C. and 7 B.C. is as close as modern research has been able to come in attempting to fix the date of Jesus' birth, and 4 B.C. is the year most commonly given.

The fellow we have to thank for that was Dionysius Exeguus (c. 500-560), a monk or abbot who wrongly dated the birth of Christ on Dec. 25, 753 according to the Roman system (that is, 753 years after the founding of Rome).

John T. Tuthill

Dallas, Texas

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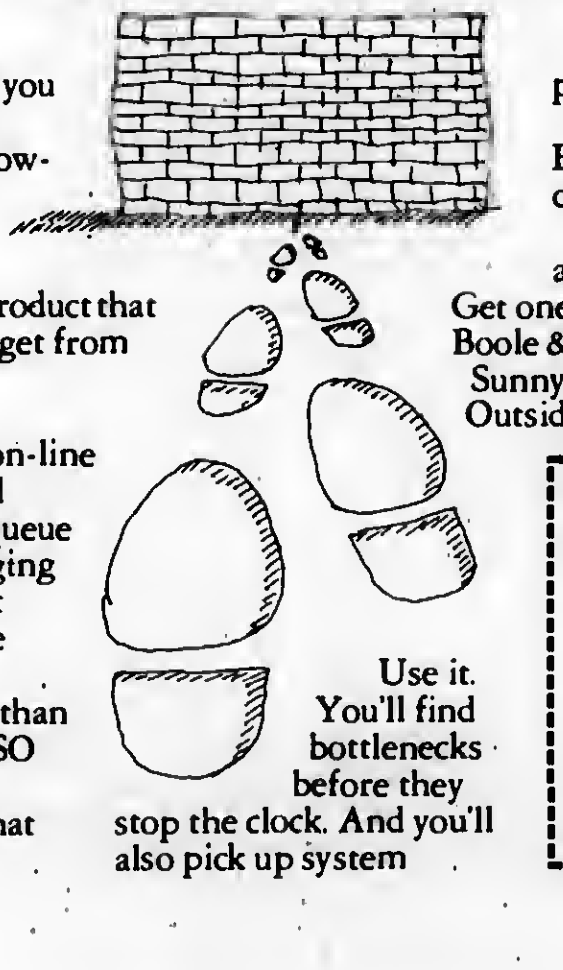

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Maturity of Users, Vendors Set Tone Throughout Year

By Don Leavitt
Of the CW Staff

Some years are clearly remembered by major events that create waves; others are more like millponds – one knows there's movement, but it's hard to see anything there until the weter goes over the falls and does something useful.

IBM's "functional stabilization" of DOS/360 several years ago created waves felt by both software vendors and users, but 1976 was a millpond..

There were lots of products introduced in 1976 and many, both old and new, were acquired and installed in user sites of all sorts and descriptions, often with good results. But there seemed no obviously significant trends or breakthroughs in the items brought to market.

The use of packages became an accepted way of life in many installations. More than mere acceptance, however, there was a sense of maturity displayed by many users and a good number of vendors.

Both sides of what quite naturally might be an adversary relationship seemed to recognize they would accomplish more by working together. User groups appeared to gain influence with their vendors and few if any horror stories were heard about packages that didn't work and vendors that didn't care.

The maturity developing in the software package arena was matched by the users and vendors of remote computing services. Splashy new capabilities were the exception; solid work to use existing facilities – especially in the data base management area – was the rule.

Interest in data base management systems (DBMS) and their natural extensions was high among package users. So was user concern about on-line systems and teleprocessing monitors.

But that seemed mostly for the bigger installations: less than 5% of all installations are actively using DBMS now, according to reliable industry estimates.

A Look Back

More widespread – and rather more blurred in the way it was pursued – was an interest in making DP installations more productive.

DP operations have always been both costly and mysterious in the eyes of corporate management. Cost justifications and potential benefit analyses were required for more and more major projects in 1976, whether they involved hardware changes or software developments.

Beyond that, a number of products were introduced in 1976, each with the design goal of getting the non-DP user directly involved in the work.

Perhaps nowhere was that goal more emphasized than in IBM's Virtual Storage Personal Computing (VSPC) system which was "introduced" very early in the year. Designed to make the 370 "more approachable" by non-DPers, VSPC apparently did this by putting another layer of software between the user and the machine, in addition to operating systems, language processors and file access routines.

Thus, while it eased the way of the novice, this particular product apparently added considerable overhead to the basic DP operation and, in effect, flaunted the professionals' desires to have more efficiency.

Interest in sticking with known equipment (in one case) and known software (in another) led to two separate products for IBM-based installations. In March, Software Design, Inc. offered a package that allowed unmodified IBM DOS/VS and compatible applications to run on 360 hardware, a situation that might well mean longer life for that equipment, first introduced in the mid-1960s.

In May, Software Products, Inc. of Mill Valley, Calif., introduced DOS/MVT which support-

(Continued on Page 20)

DEC Develops APL Compiler, Terminal Compatible With Entire PDP-11 Line

MAYNARD, Mass. – Digital Equipment Corp. has developed APL-11 – a compiler for use across the company's entire range of PDP-11 minicomputers – and a modified version of a standard terminal to work with the peculiarities of the language's notation.

APL is an interactive language designed to provide users with quick solutions to mathematical problems of moderate complexity, DEC said.

The language is built around a set of unique symbols, each of which represents a desired operation. The symbols and the terms on which they operate may be combined to create extremely detailed and yet concise code, according to a spokesman.

As developed by DEC, APL-11 apparently includes support for all of the generally accepted operators. The "workspace" available to users of the first release is 29K bytes; this will "undoubtedly" be increased in later releases, the spokesman said.

Although APL has been implemented on a growing number of different CPUs, DEC claimed the introduction of APL-11 marks the first time it has been available across any entire "family" of minicomputers.

Compatibility of the software – and of user source code – extends from the floppy disk-based PDP-11/3V03 LSI configuration to the top-of-the-line PDP-11/70 system and includes both RT-11 and RSTS/E environments, the company said.

Variation on Printer

Concurrent with its announcement of APL-11, DEC also introduced a variation on its "standard" LA36 printer terminal to work with the new language.

The LA37 has a keyboard that permits entry of APL symbols as well as alphanumeric data; it also has a dot matrix printhead for hard-copy output.

The terminal comes in two versions, supporting either the EIA connection or the normal teletypewriter loop, DEC said.

While the LA37 was tailored specifically to APL, users with LA36s can have them adapted to the additional language through an option first announced a year ago [CW, Jan. 5].

Beyond that, any APL terminal with the appropriate hardware interfaces could be used as an I/O device for APL-11, the spokesman added.

The LA37 costs $3,330. The APL-11 compiler, which will be ready for delivery late next spring, will carry a license fee of $1,650, the company said from Maynard, Mass. 01754.

IDMS Gains On-Line Query Capability

WELLESLEY, Mass. – Cullinane Corp. has added a separately priced on-line Query option related to its Integrated Data Base Management System (IDMS).

Query handles the interface between IDMS and "most of the currently popular" teleprocessing monitors, Cullinane said.

Described as a management-oriented inquiry/response facility, Query permits real-time retrieval of key-indicator information from IDMS data bases. Key indicators include any data that is vital to a user's daily business and decision making, a spokesman explained.

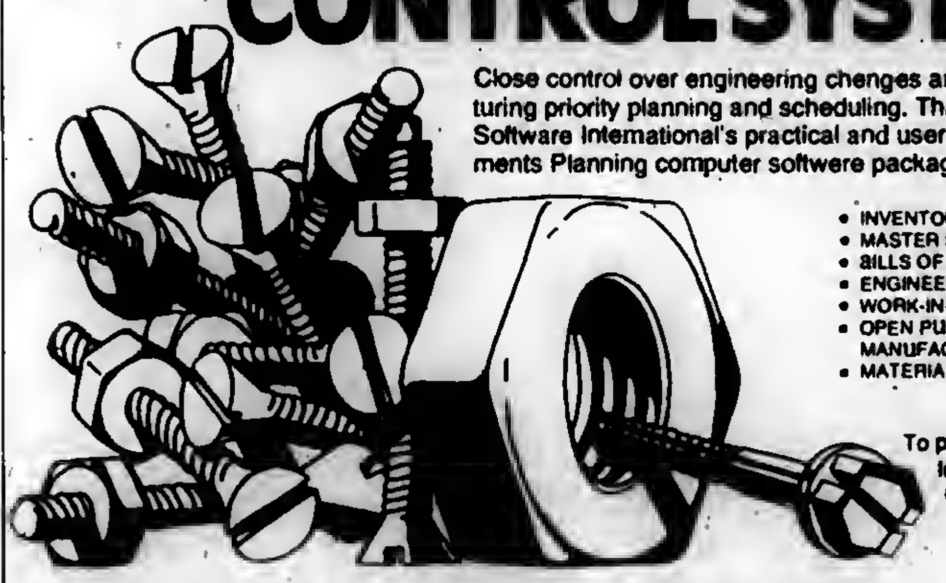
The on-line display of key indicators and more elaborate operations are supported by Query's "English-like" command language; the system is capable of working with a spectrum of file access methods, the spokesman noted.

While the simple command language was developed to aid non-DP managers and clerical personnel, it has also been recognized as a very effective tool for data base administrators and programmers in tracking records and setting relationships through the data base, Cullinane claimed.

The package also provides record editing according to specifications already stored in the data base. On the "output" side, it is said to support an average response time of "approximately three seconds."

Query is available for Cullinane's Shadow II and for IBM's Customer Information Control System (CICS) and Time Sharing Option (TSO) environments. Interfaces to other major teleprocessing monitors, including Turnkey Systems, Inc.'s Task/Master and Informatics, Inc.'s Intercomm, are currently under development, Cullinane said.

Release 1 of the Query option is available to IDMS users for $9,000, the vendor added from the Wellesley Office Park at 20 William St., Wellesley, Mass. 02181.



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Digest of Federal Programs

FSEC Publishing First Catalog

WASHINGTON, D.C. – The first issue of the "Federal Software Exchange Catalog" will be available in late January and updates are expected every three months after that, according to Franklin W. Leibsly, who runs the Federal Software Exchange Center (FSEC).

The center was organized earlier this year [CW, July 19] to encourage sharing of programs by government agencies. A joint venture of the General Services Administration and the National Technical Information Service, FSEC is meant to be self-sustaining but not profit-making Leibsly said.

The catalog will contain abstracts of programs reported to FSEC by participating agencies under a plan outlined in February by a Federal Property Management Requirement. Users in federal, state and local government units can purchase copies of whatever listed programs they need through the center.

Charges made by FSEC for the programs will vary depending on their size and complexity but will be minimal compared with the cost of developing the software all over again, Leibsly said.

Organization of the catalog may change during its first year; the optimum indexing scheme is still not clear. The publication might be laid out by application areas, programming languages, operating systems or machine environments or a combination of these keys, he pointed out.

The rules under which FSEC was organized prevent any of the programs in the exchange being considered in the public domain. Therefore, nongovernment users cannot participate in the program, Leibsly noted.

But once the system is fully operational, federal agencies will have to participate. They will be required to certify that they have searched the catalog unsuccessfully before they can be granted authorization to seek software from outside sources.

The 1977 catalog, including updates, will cost $75; requests must be accompanied by a complete mailing address and a properly authorized purchase order or check payable to the General Services Administration, Leibsly said from the FSEC, 5285 Port Royal Road, Springfield, Va. 22161.

Maturity of User, Vendor Set Tone for Whole Year

(Continued from Page 19)

ed DOS operations on either 360 or 370 gear. Conceptually similar to other DOS enhancements, this one claimed the ability to support 12 concurrent tasks, a marked improvement over the three partitions backed by IBM's DOS/360 or the six supported by The Computer Software Co.'s Extended DOS (Edos).

Languages' Role Large

Languages played a large part in the product announcements and software-related news in 1976. Data General, for example, introduced a Cobol said to be compatible with the 1974 standard for use on its Eclipse commercial systems. Sycor offered Cobol for its 440 terminal system, while Datapoint implemented its version of the language on the 5500 later in the year.

For its part, the American National Standards Institute (Ansi) introduced draft standards of Basic and Fortran in the spring and approved the PL/1 draft that had been out for review since 1975 in the summer.

Following an unconventional but completely legitimate route, the users of Mumps put a draft standard of that language out for consideration; all indications pointed to its ultimate acceptance as a standard under Ansi's sanction.

Meanwhile the Federal Government moved to bring its Cobol Compiler Validation Service up to the 1974 specifications and to implement a similar audit system for Fortran processors.

At year-end the Fortran testing routines were said to be available from the National Technical Information Service.

In a move that probably couldn't be matched by any other group of users but must have given some hope to taxpayers, the government also created the Federal Software Exchange Center to encourage the sharing of existing programs by federal agencies..

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A 'Star' Is Born

ROCKVILLE, Md. – Businesses that must respond quickly to a large and constantly shifting volume of demands from customers can manage complex workforce systems with the Scheduling Time and Resources (Star) service now available on the General Electric (GE) remote computing network, according to a spokesman.

Star helps high-volume, customer-oriented service businesses forecast, schedule and assign personnel so there are enough employees working in the right places at the right times, without overstaffing, GE said.

The system can manage a workforce of up to 1,000 employees at any one business location, the vendor added..

Star uses statistical techniques to forecast the number of positions needed to handle anticipated workloads and to schedule individual workers. It also maintains records of the assignments and prepares management reports of how the scheduling was handled, the spokesman said.

Customized for Each User

Star is tailored to each user to take into account a business's legal and contractual agreements affecting such areas as length of employees' workdays and length of work breaks, he said.

Star consists of five modules – forecasting, scheduling, allocating, assigning and administering – which can be used independently or as an integrated system, he said.

Mark III service on which Star is based is available toll-free in more than 500 metropolitan areas in 20 countries, GE noted from network headquarters, 401 N. Washington, Rockville, Md. 20850.

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Easing Return to Society

On-Line DBMS Monitors Drug Addicts' Rehabilitation

NEW YORK – The Vera Institute of Justice has successfully implemented a large-scale program to rehabilitate drug addicts and ex-convicts – by putting them to work in carefully controlled situations, according to Dr. Norman J. Jacknis of the institute.

The program is complex enough so that an on-line data base management system (DBMS) was needed to keep it moving, Jacknis said.

Administered by the Wildcat Service Corp. (which was created by Vera), the program started in 1972 and has since helped some 4,000 ex-addicts regain useful and productive lives, Jacknis stated.

The key to Wildcat's success is in providing subsidized jobs that initially impose low stress levels on the participants, he noted.

Economic productivity of the projects assigned to the workers is gradually increased, resulting in a smooth transition from subsidized to completely nonsubsidized jobs during the period of their enrollment (they "graduate" from the program in 18 months or less), Jacknis explained.

At the same time, job-related stress is gradually increased until real-life environments are simulated, he stated.

Most of Wildcat's expenses, including salaries paid to the participants, are derived from welfare checks turned over by the participants, manpower training grants and revenues resulting from the work projects, he added.

DBMS Angle

Where does DBMS fit in? When there are 1,400 participants concurrently enrolled in the program, 300 simultaneously active projects to which they are assigned and an overall $18 million budget to administer, there is a lot of data to manage, Jacknis contended.

Add to the already substantial information processing workload the necessity to carefully match individual participants to available jobs, he said.

Then consider the dynamic nature of the program and the need for tighter controls to facilitate growth of the program, and to enable even larger-scale national rehabilitation programs to be modeled after Wildcat.

The result: exit of the existing remote job entry/batch system, entrance of the interactive DBMS, he added.

Vera's data management needs were solved through the facilities of the Rapidata, Inc. remote computing network, including DBMS-10 software, according to Jacknis.

Personnel and project status systems form the nucleus of the data base. Typical personnel data, similar to that found in a commercial environment, is kept for each participant in this simulated real-world program.

Time sheets for each participant are generated weekly based on projects assigned for the following week; completed sheets are later processed to generate performance/attendance histories and to provide input to the payroll system, he explained.

Keeps Track of All Records

The data base keeps track of all projects, including current status, cost data and a historical trail of participants assigned to each project. Contract information and a general ledger system are also built into the model.

Plans for expansion include adding inventory and supplies requisition modules to the data base.

Historical records of personnel status changes (promotions, demotions, changes in skill or adjustment levels) are typically accessed for specific individuals; but changes that relate to a given project or class of projects can be quickly assimilated to examine the rehabilitative effects of certain kinds of projects, Jacknis stated.

Data Basics

Database flexibility was of utmost importance as new data and new uses for the data will be added to the system as the program develops, he explained.

Rapidata's X2C data management language was a prime factor in how fast the system became operational, Jacknis stated.

"In one and one half weeks of part-time effort, several complex reporting and analysis programs were written that ordinarily would have taken a year to develop and debug – and this included learning X2C from scratch," he said.

Database updating as well as reporting functions are programmed in X2C.

The ability of DBMS-10 to represent naturally occurring data relations within the database network has eliminated duplication of data, resulting in a high degree of system integrity, Jacknis indicated.

Integration of various kinds of data previously stored in separate, unrelated files resulted in yet another unanticipated bonus; it enforces a much tighter operational discipline among Wildcat employees involved in administering the program, he explained.

An added benefit of the centralized on-line data base is the increase in effective communication between groups, according to Jacknis.

For example, promotion or demotion information logged into the data base is instantly available for use by the disbursements group. Newly procured projects are immediately made known to the project assignment and scheduling groups.

In turn, project planning and inventory/supply groups are alerted to the new requirements, he added.

Not all data must be updated in real-time, however, and the system has been designed to take advantage of the network's off-peak rates for many routine updating and report runs, Jacknis said.

Processing of these jobs is automatically started by the time-sharing monitor at a predetermined time each evening or on a given night of the week.

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Training Goes to DPers, Users As California Unit Adopts A/V

SACRAMENTO, Calif. – Training should be scheduled for the employee – not the other way around; and, whenever possible, training must be directly related to a current work assignment, according to William B. Coleman, developer of Sacramento County's systems and data processing training.

Sacramento's objective required in-house programs, immediately available to any employee or group, Coleman indicated. "Our analysis led to the audio/visual (A/V) approach," he said.

"Traditional classroom methods are too inflexible to meet our need. Our availability requirement would put the cost of classroom instructors out-of-sight. Packaged training, self-study video tape and film products were the only way for us to go," he explained.

The Human Connection

"We're meeting the objective," Coleman said. "When Sacramento employees need to learn or refresh a given subject, they call the training center for a self-study module which they get within 24 hours."

Organized group programs can also be arranged and this improves the effectiveness of A/V training, according to Coleman.

Line managers often conduct group programs to bring up specific skills. They identify self-study modules for their people to learn in the training center and enhance these with group discussions and practice problems, he continued.

Sacramento is a medium-sized county with a population of 700,000. Of the 6,500 county employees, about 130 are in central DP, but the county is taking a big approach to training, according to Coleman.

"One way or the other the cost is there. You can pay people to do the job two or three times or you can teach them to do it right the first time.

First Big Step

The first big step was a 1974 purchase of 150 tape modules offered by Edutronics, Inc., Coleman said. Considered a "basic technical package," it starts with elementary DP ideas and vocabulary and progresses through data base, communications and control concepts, he explained.

"The initial 'package' was sound and we've added most of the newer modules. It's not a complete answer for our technical people, but our supervisors can fill in the gaps," he said.

"We also use about 50 of the modules for our Customer Training Program, which gives our users a basic understanding of DP. We average over 300 planned student modules per month and about half of these are user training," he noted.

The training center has six Fairchild 70-07 film cartridge projectors and a Sony reel-to-reel unit in seven individual study carrels.

Their use is scheduled and administered by a training librarian who calls on-line people to help trainees with the occasional technical questions. The librarian also administers and grades retention tests, Coleman stated.

Sacramento uses self-tests during each module so trainees can tell how much they've learned. The rule is, repeat the training material until you have it 100%, he added.

A retention test, administered by the librarian, is scheduled at least a week after each study module. A retention score under 90%, which is rare, requires a retake.

Multivendor Approach

Believing in a multivendor approach, Sacramento recently added an A/V package from Advanced Systems Inc. (ASI), according to Coleman. Concentrating on administrative management skills, it will help develop the user/DP involvement that is vital in reworking operational systems and building new ones, he predicted.

"The money you spend is important," he said, adding "the place to measure training cost is at the point of use. Our training center cost is under $2 per student module."

We measure benefits there too – 90% retention. The line managers measure effect on production and it must be good; they keep sending people back for more," he continued.

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COMMUNICATIONS

Although Network Area Hazy

Increased Flexibility Marks '76 as Year of the User

By Ronald A. Frank
Of the CW Staff

Teleprocessing users gained more equipment flexibility during 1976 as independent terminal suppliers improved on IBM CRT capabilities.

At the same time, IBM "throttled back" somewhat on its Synchronous Data Link Control (SDLC) by providing Binary Synchronous compatibility for previously SDLC-only devices.

And 1976 saw the independents phase into the System Network Architecture mode. In June, Sanders demonstrated an SDLC interface for its 3270-type CRTs and other vendors said they were ready to follow as soon as IBM released enough technical details on the network architecture.

Despite the promises, relatively few users were operating SDLC in-house nets. And as users were evaluating the merits of distributed DP, the costs of such nets kept rising.

IBM increased maintenance prices late in the year for its most popular CRT and teleprinter devices while introducing the Advanced Communications Function (ACF) for SNA networks. ACF promised truly multiple mainframe networks, but the necessary software was still months away.

In the service area, Telenet increased its packet-switched services and the Canadian Datapac net was demonstrated in an international hookup across the Atlantic. The packet-switched standards area seemed to be moving toward universal adoption of the X.25 protocol.

But the amount of full-duplex traffic using packet-switched networks was still limited. Most of the packet users were operating on asynchronous lower speeds while modem suppliers made 9,600 bit/sec transmissions more reliable on private-line nets with the introduction of network processors that stressed line monitoring and error-checking features.

A Look Back

AT&T phased into the applications-oriented service area with its Transaction Network Service which utilized its ESS central office as a switching device for credit authorizations and related financial services.

The AT&T Dataspeed 40/4 was tariffed in 40 state jurisdictions by year-end and the Federal Communications Commission (FCC) apparently gave the go-ahead for an interstate tariff as well. There was no doubt the phone company was becoming more aggressive as it followed the lead of Vadic and Universal Data Systems with the introduction of a full-duplex 1,200 bit/sec, two-wire data set.

Bell also went into the "portable terminal" area by unveiling the 43 Teleprinter which used the plug-and-jack arrangement tentatively approved by the FCC. Few devices were operating under this system without Data Access Arrangements because of legal tangles and unclear regulations.

Network experts saw the Bell Transaction Network Service as the forerunner of a general-purpose, packet-switched offering by Bell. And there were indications that AT&T was set to announce such a service soon. Although AT&T had told some international experts the service would be X.25-compatible, it was clear the options rested with Bell.

As teleprocessing equipment costs went up, the trade-off between minicomputer-based networks vs. more conventional central site mainframe-based configurations became more important but less clear.

Some users like Citibank tied together the new IBM System/1, but it was still an immense undertaking to disperse a large, more conventional private-line network.

As 1977 dawned, the regulatory arena made it very difficult for users to plan network upgrades several years in the future and many of these issues were being argued in Washington with very limited user input.

Gandalf Upgrades PACX Speed, Control

WHEELING, Ill. – Gandalf Data, Inc. has introduced upgraded versions of its Private Automatic Computer Exchange (PACX) systems offering higher transmission-handling capabilities and additional monitoring and control features.

PACX systems allow users to connect a larger number of terminals to a given number of PACX ports, according to a Gandalf spokesman.

Each PACX system is composed of five function blocks including the terminal logic and port logic, which both interface the system's control circuitry and multiplexer.

The control circuitry is accessed by the control panel, which reportedly enables the operator to communicate with PACX for control and monitor functions.

The PACX power supply provides power for normal system operation and also auxiliary power – for PACX I and II systems – to preserve memory contents in the case of a power failure, the spokesman noted.

The upgraded PACX II and Mini-PACX II systems include a control port for the additional monitoring and control functions, the spokesman said.

Four Versions Available

Four versions of PACX systems are available – PACX I and II and Mini-PACX I and II. Each version is modular and can be expanded from the minimum of four terminal connections and eight ports in multiples of four and eight respectively.

PACX I and II systems handle a msximum of 254 terminals through a maximum of 126 input ports. Mini-PACX systems can handle up to 48 terminals through up to 32 port connections, according to the company.

Four different terminal connections are possible with any PACX version: through short-haul modems equipped with class-determination switches; through the dial network and conventional modems; by dedicated lines and conventional modems; and by direct connections through EIA interfaces.

Choice of Service Class

The choice of service class on full-duplex, dedicated lines can be determined by the terminal user with a Gandalf Thumbwheel Dial Unit or similar device, he said.

Synchronous or asynchronous operation is possible with dial-up or dedicated lines. PACX I and Mini-PACX I are capable of asynchronous operation at 4,800 bit/sec and synchronous operation at 9,600 bit/sec; the PACX II and Mini-PACX II upgrades operate at 9,600 bit/sec and 19.2 kbit/sec respectively, according to the firm.

In addition, the upgraded versions can monitor requested connections and disconnections by means of a remote computer port, Gandalf said. They also include the control port facility enabling version II operators to change port classes and force connections under CPU control, the spokesman noted.

PACX systems accommodate terminal users on a first-come, first-served basis in normal operation, he said.

On the computer port side of the PACX devices, connections can be made directly to the CPU from any PACX port board or through data links using limited-distance data sets, multiplexer links or long-haul modems, he added.

PACX I and II systems were specifically designed for installations with a large number of various types of remote terminals accessing a smaller number of computer ports, such as university or research environments, he said.

The basic price for a Mini-PACX II is $4,000; the PACX II hardware costs $7,500. A "typical" system would be a 72-terminal network with equal groups communicating directly to PACX II through short-haul modems and another group transmitting over dedicated lines through long-haul modems, the spokesman explained.

This terminal network contending for 24 PACX II ports would cost $17,100, he said, noting prices for Gandalf equipment were used in the price calculation.

Gandalf is located at 190 Shepard Ave., Wheeling, Ill. 60090.

Telenet Adds In-Wats Service

WASHINGTON, D.C. – Telenet Communications Corp. has instituted nationwide in-Wats service for access to its packet-switched public network for computer and terminal communications.

The "800"-number Wats service supplements local network dial-in numbers available in the U.S. and Canada, according to a Telenet spokeswoman.

The connection charge for use of the Wats number is $14/hour, which Telenet estimated as 20% to 30% less than the cost of the average long-distance call depending on the business area called from and the time of day, she said.

The network port charges are included in this figure, the spokeswoman noted.

An optional caller identification service has been provided to allow the carrier to screen incoming calls for customers.

Telenet is located at 1050 17th St. N.W., Washington, D.C. 20036.

Focis Promoting Fibers

VERNON, Conn. – A society has been formed to promote the use of fiber optics for data communications.

The Fiber Optic Communication Information Society (Focis) includes representatives of both manufacturers and users of fiber optic cables, connectors, devices and systems, according to a spokesman.

Focis was formed to aid the transition from the prototype phase to widespread usage and mass production, which is expected in the next two years, he added.

Membership in Focis is $20/year. The society can be reached at P.O. Box 2264, Vernon, Conn. 06066.

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MDB Has Multiplexer for Novas

ORANGE, Calif. – The MDB Systems, Inc. Model 8063 multiplexer for Data General (DG) Nova computers provides an interface for four or eight asynchronous data sets or local terminals with an RS-232C interface.

All data transfers are under program control of the MDB multiplexer, with each of the transmit/receive channels treated as a separate device with a common device code address, the company said.

Additional multiplexer interfaces can be added to build a system with a maximum of 64 channels having the same device address, a spokesman noted.

The features of the 8063 allow the user to build a communications system requiring only one slot in the Nova chassis.

The price for a four-channel Model 8063 is $1,250; the eight-channel version costs $2,250 from MDB at 1995 N. Batavia St., Orange, Calif. 92665.

Employers' Recruitment Strong

'76 Communications Salary Levels Up

NEW YORK – Communications industry employers began recruitment in record numbers in 1976 and salary levels generally increased throughout the industry, according to Personnel Resources International, Inc.'s annual telecommunications salary survey.

The industry has exhibited a strong recovery from last year's recession hiring picture, the New York-based firm specializing in telecommunications career placement noted.

There were fewer layoffs this year than in the past two years and those who did lose jobs, such as Data Transmission Corp. (Datran) employees, usually found new ones quickly, Personnel Resources said.

Employees who had job-hunting difficulties were at the $23,000-and-up salary level or had not kept up with the technical state of the art, it added.

Independent telephone companies had increased personnel demands for all types of engineers with data communications backgrounds, the placement firm noted.

In addition, the survey indicated, the satellite and specialized common carriers continued to be a good source of employment for industry personnel.

Bell Raises High

In compiling the survey, Personnel Resources found that Bell "and a few other companies" have continued to grant salary increases to various levels of employees out of line with general industry averages, "which would make them untouchable by other employers."

This was striking because "most of these employees are working in a noncompetitive environment," the placement firm said.

Salaries for message-switching programmers kept up with inflation, rising about $1,000 from 1975 levels to between $14,200 and $17,200. Senior telecommunications programmers earned between $16,200 and $20,100, also an increase of about $1,000 from 1975, survey results indicated.

Communications managers experienced heavy salary increases of about $4,000, rising to between $23,100 and $30,600, according to the survey.

Analysts with some data communications experience earned $16,400 to $20,900, representing increases of $1,400 to $1,900 over 1975 levels. Communications and consulting directors earned $21,200 to $28,700.

Salaries in the New York City area were $500 to $3,500 higher than national salary averages in those categories, according to survey figures.

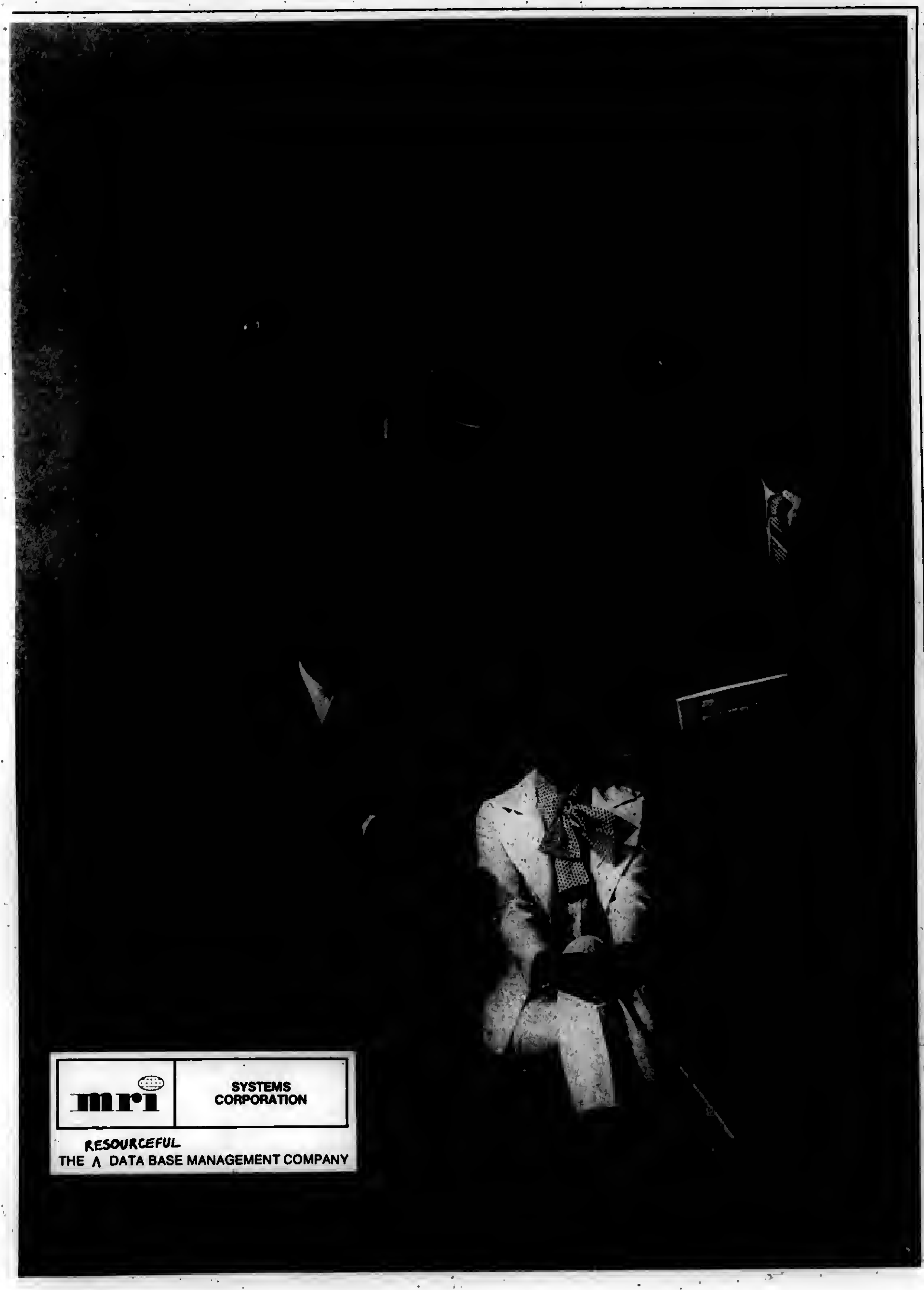
Personnel Resources said the survey represented the "mid-50% of data" taken from recent applications and placements made by the firm. It added some extrapolations and estimates were made to complete the survey.

Free copies of the survey are available from the firm at Suite 1234, 342 Madison Ave., New York, N.Y. 10017.

DEC Reduces Service Costs

MAYNARD, Mass. – Digital Equipment Corp. has reduced the service costs for its 110- to 300 bit/sec Decwriter II dot matrix terminal from $25/mo to $19/mo.

The 24% service rate reduction is effective in January and applies both to current and future users, according to the firm in Maynard, Mass. 01754.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Unitech Cluster Offers Modularity for Distributed DP

AUSTIN, Texas – Unitech, Inc. has taken a modular approach to distributed DP with its microprocessor-based keyboard-to-diskette terminal system.

The Data Entry Station Cluster (Desc) is a network component which performs as a stand-alone device communicating with an IBM host site for data entry and distributed data base management, according to a Unitech spokesman.

The cluster can also be linked with Unitech UT-1 or UT-2 remote batch terminals to communicate with IBM, Control Data Corp., Univac or Honeywell host sites and can be configured to meet special user requirements, he said.

Each Desc can contain one to four CRT/keyboard operator terminals, one to four IBM-compatible disk drives and a cluster controller with a Motorola M5800 microprocessor handling up to four Descs.

The diskette drives can be placed at each individual workstation or in a master drive cabinet. Stations can be located up to 10 feet apart from each other and up to 500 feet from the Desc controller, although greater separations can be achieved with asynchronous modems, the company said.

Desc operating software is available for binary synchronous communications in IBM 2780 emulation mode via RS-232C-compatible modems at transmission rates up to 9,600 bit/sec.

It is also available for cluster networks where Desc is joined with a Unitech remote batch terminal communicating to IBM, CDC, Univac or Honeywell CPUs.

Asynchronous communications with external systems through an RS-232 interface are also possible, the Unitech spokesman noted.

In addition to remote communications facilities for full- or half-duplex standard data links, Desc reportedly has the capability for advanced data link control procedures such as IBM's Synchronous Data Link Control (SDLC).

Since the cluster is programmable, the spokesman said, it can accommodate future protocol and code requirements without severe equipment modification.

Terminal screen capacities are 25 lines of 80 characters each and the diskette capacities range from 151K-byte, 80-character records to 242K-byte, 128-character records, the spokesman said.

Each cluster can be supplied with print capabilities from an optional 80- to 200 line/min printer, he noted.

Up to 32 workstations are possible in Desc configurations grouped around a UT-2 or up to 16 when grouped with a UT-1.

The basic Desc consists of one CRT/keyboard terminal, one diskette drive and the cluster controller and costs $6,600. Each additional CRT terminal costs $2,600 and additional disk drives are priced at $1,000 each.

The optional printer for each four-station cluster costs $5,500. Unitech is located at 1005 East St.-Elmo Road, Austin, Texas 78745.

Terminal Transactions

Cummins Remote CRT Works With Keyscan

GLENVIEW, Ill. – Cummins-Allison Corp. has a remote CRT terminal designed for operation with its 5400 Keyscan system.

The 5400 Keyscan addresses the Model 5441 remote terminal as if it were installed at the host site through dial-up, half- or full-duplex lines, Cummins said.

With the 5441, remote keystation operators can enter, verify, correct and update data and transmit the data to the 5400 for processing, according to the firm.

The terminal has an integral modem and an intelligent host processor terminal controller which reportedly allows installation of the 5441 without operating system software changes.

Each intelligent controller can support up to four remote stations; a total of 32 remote or local keystations can be supported by the Keyscan system, a Cummins spokesman noted.

Purchase price of the 5441 remote terminal is $3,735; it can be leased for $95/mo on a two-year contract including maintenance; Cummins said from 800 Waukegan Road, Glenview, Ill. 60025.

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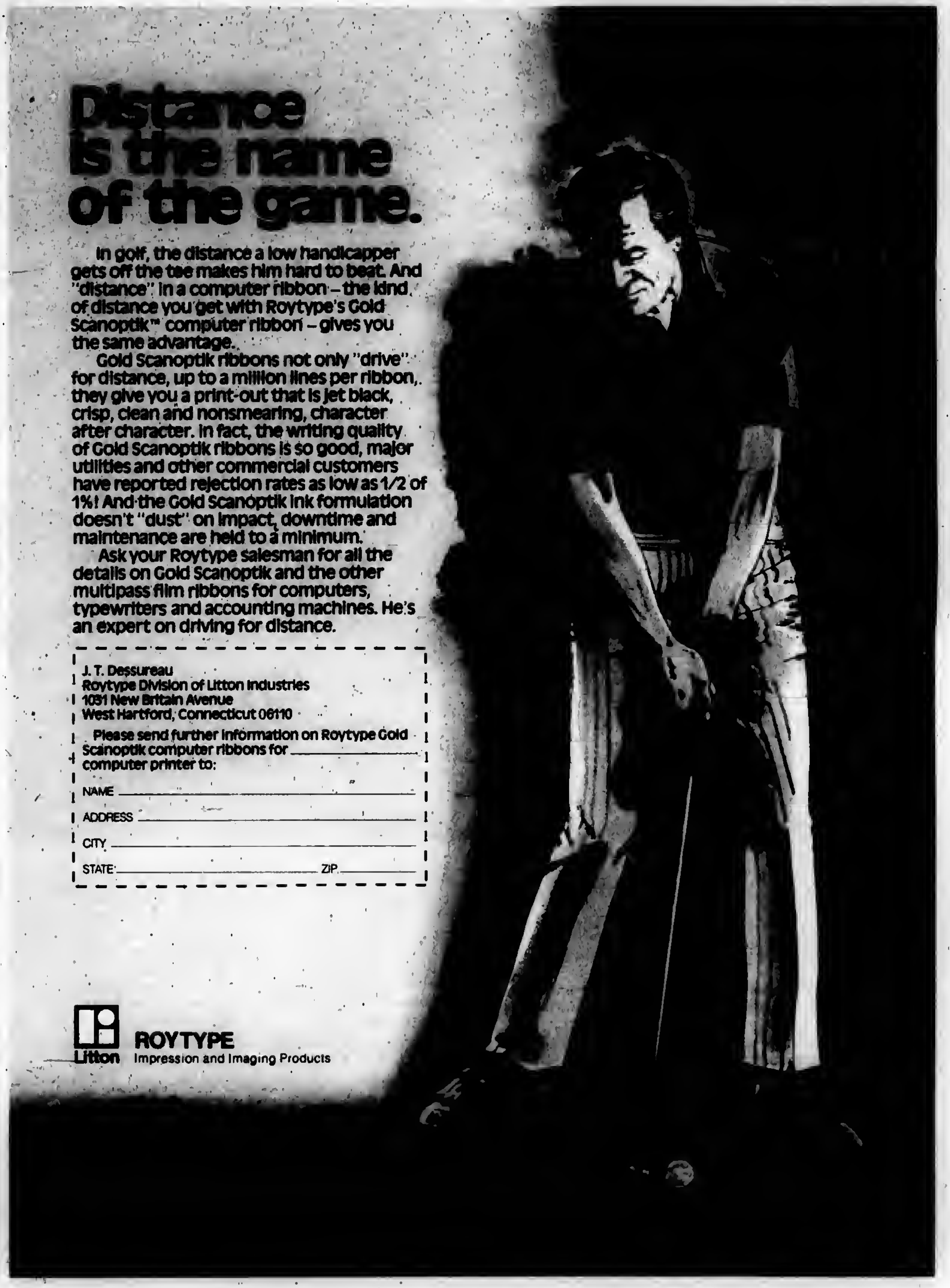

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General Instrument Makes Additions To Its 400 Series of POS Data Systems

NEW YORK – General Instrument Corp. (GIC) has introduced two additions to its Unitote/Regitel electronic point-of-sale (POS) 400 series data systems.

The computer-controlled 420A and the intelligent 425 terminals are said to be interactive and programmable to provide retail users with tailored capabilities.

The 420A is controlled by dual in-store minicomputers and features a 16-character alphanumeric display combined with a prompter display to lead the operator through each transaction, the company said.

Terminal Transactions

The stand-alone Model 425 is capable of controlling transaction sequences off-line in the event on-line communications with the single store-level communications controller (SLCC) are disrupted or if the SLCC is down, according to a spokesman.

Both terminals have 23-key interactive keyboards etched with operating instructions tailored to each store's needs reportedly allowing salespeople to select automatically sequenced transactions.

The salesperson's display on the 425 provides the last five digits of data entered into the system, the spokesman noted.

Both 400 series terminals feature multistation dot matrix printers which handle up to 40 characters of alphanumeric information on each line.

The journal/receipt station is designed to use single or two-part paper and provides an audit trail on the journal roll as well as a customer receipt if the two-part paper is used, the spokesman stated.

The Model 420A costs $3,120 and the intelligent Model 425 is priced at $3,650.

GIC is at 100 West Road, Towson, Md. 21204.

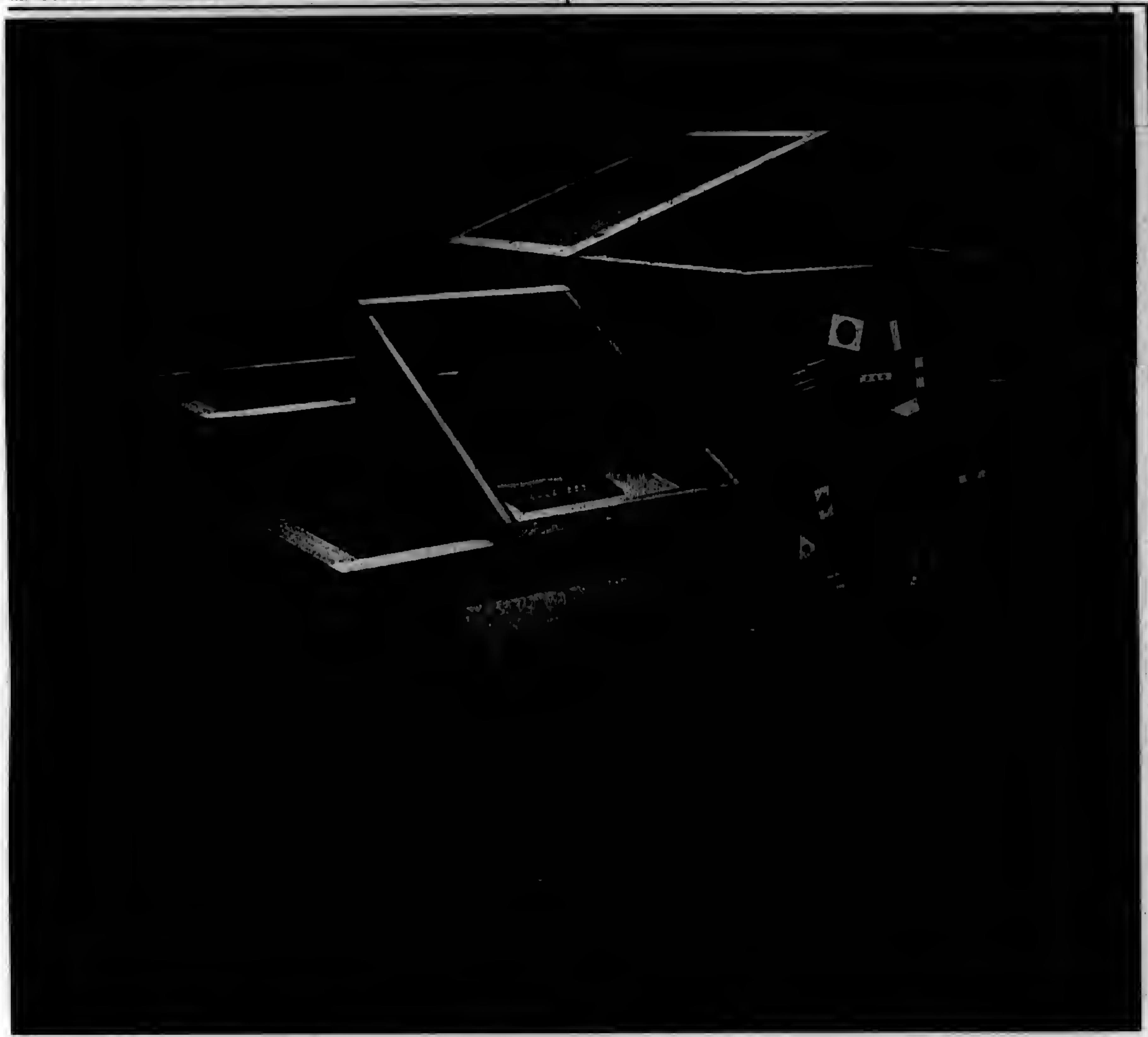
Image Magnifier Interfaces CRTs

VERONA, N.J. – The Image Magna I from Image Magnification, Inc. (IMI) is designed to interface televisions and CRT computer terminals to display a large high-resolution black-and-white picture.

Reportedly capable of direct display of computer-generated characters, it can be interfaced with most raster scan CRT terminals and will display as many as 24 lines of 80-character density per line, according to a spokesman.

The Image Magna I produces images of from 3 by 4 feet up to 15 by 20 feet with a picture throw ratio of two times the screen width, he indicated.

IMI's Image CRT display magnification device is priced at $4,200 from the firm at 538 Bloomfield Ave., Verona, N.J. 07044.



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SYSTEMS&PERIPHERALS

A Look Back

Amdahl Installations, Itel Introductions

Year Highlighted by IBM Plug-Compatible CPUs

By E. Drake Lundell Jr.
Of the CW Staff

It was the year of the IBM plug-compatible CPU as 1976 saw the first deliveries of Amdahl Corp.'s 470V/6 replacing IBM 370/168s and the introduction of the Itel AS/4 and AS/5 as replacements for the 370/158.

The overwhelming user acceptance of the Amdahl unit was particularly impressive and boosted the prospects for the entire field.

But other potential entrants into the plug-compatible CPU area are still watching the experiments before jumping into the field – especially Control Data Corp., which may market a 370/145 replacement, and Hitachi, which is eyeing the 370/135 market.

And IBM pricing moves – plus the introduction of the 370/138 and the 370/148 – may make the future for these competitors more hazy.

In 1976, however, there were few problems in the area; the first users of the Amdahl machine all reported complete IBM compatibility, increased throughput and major savings over comparable IBM systems..

For example, the Southwestern Ohio Regional Computer Center estimated savings of $700,000 over the next five years from using the Amdahl system instead of an IBM 370/168. In addition, by tying independent peripherals into the system, the center will save an additional $200,000.

At Massachusetts Mutual Life Insurance Co., savings were predicted at over $1 million during the next five years, and the company said "the compatibility is real" between the Amdahl system and the previous IBM units.

At the University of Michigan, a 2M-byte 470 was reported performing various batch and on-line jobs 30% to 130% faster than a 2M-byte IBM 370/168.

And so it went from the first users of the Amdahl systems – all reporting increased speed and reduced costs.

This success story was one of the reasons Itel jumped into the field, marketing the AS/4 and AS/5 that range in power from 1.4 times that of the 370/148 to the equivalent of a 370/158-3MP system, according to Itel.

But the Itel systems won't get their real tests until 1977, when the first users get their hands on the systems and really test them in an operational mode.

What others do in the field of plug-compatible CPUs will also have to wait for 1977, if the IBM announcements of the 370/138 and 370/148 have not already foreclosed the field.

For the first time in history, IBM offered increased power at reduced costs, which may make it difficult for others to enter the replacement market for those machines.

The two systems on the drawing boards – A CDC offering in the 145 and 148 area and a Hitachi product in the 135 and 138 class of size – could have easily offered price/performance breaks for 135 and 145 users, but with the reductions offered by IBM with the 138 and 148 such savings may be harder to come by.

Action Not Slow–But Not Also Startling

By E. Drake Lundell Jr.
Of the CW Staff

Compared with the activity in the plug-compatible CPU area during 1976, activity in the medium- and large-scale systems and peripherals field may have seemed rather slow.

But a second-look indicates this was not the case – IBM alone announced new products at an unprecedented rate of one per month, price cutting put the whole field in an uproar and innovation continued at a rapid rate.

The entire field seemed slow except for the plug-compatible CPU area because no major revolutionary systems were announced. The products that actually reached end users were upgrades and evolutionary in nature.

In addition, users and industry alike expected 1976 to be the year for IBM to announce a new range of computer systems to replace the 370 line. That hope was not fulfilled.

The major activity in the systems area came with the price cutting of memory resulting from cheaper production costs for the semiconductor memory systems used in most large computers.

But all the major mainframe suppliers were active during the year in the big systems area.

IBM announced the 370/138 and the 370/148 – the first systems in the history of IBM to offer increased performance over their predecessors at a reduced cost. Usually the increased performance also called for a price increase.

Furthermore, the firm announced the 370/168 Attached Support Processor (ASP) and the 370/158 ASP which provided 1.3 to 1.8 times the internal speeds of the "plain vanilla" 158s and 168s.

In other action, IBM offered a host of specialized terminals and peripherals, increased the memory capacity on the 370/115 and 370/125 and delivered the first 3850 systems.

Control Data Corp. remained active in the IBM plug-compatible peripherals area – along with many of the other independent peripherals suppliers which offered new memory, disk and tape options to IBM users.

But CDC also brought out a new system – the Cyber 70 Model 71, which it described as an "entry-level large-scale system." This announcement showed CDC is still active in the systems market even though its major attention has apparently shifted to peripherals and services.

Univac was also active in the systems field – but once again with upgrades and enhancements rather than anything startlingly new.

The firm introduced the Univac 90/80 at the National Computer Conference. It was the first Univac system to use emitter-coupled logic and was aimed at IBM 370/145 users or potential users.

Burroughs enhanced many of its systems during the year by introducing the B6800 with two times the power of the B6700 and an enhanced B7700 said to offer 35% greater performance than its predecessor, for example.

In addition, the firm introduced the B1800 system that is in the price and performance range of the IBM 370/115.

NCR made a major upgrade, replacing the Century series of computers with the first models of the Criterion series. The first two models – and the only ones announced so far – were the 8550 and 8570, said to offer 35% more power than the IBM 370/115 and 370/135 respectively. They were designed to fit into transaction-processing systems, which is NCR's major thrust in the systems area.

Honeywell, which was embroiled in controversy over software licensing and made a big splash in the minicomputer area, announced an enhancement to its 60/66 machines and continued to push the 60 line.

Digital Equipment Corp. was particularly active not only in its main base of minicomputers, but also in the medium- and large-scale systems area.

During the year the firm encroached further into this IBM domain with the Decsystem 1088, a dual-processor version of the 1080; announced the Decsystem 2050, which was said to have twice the power of the previous 2040 and compete in the IBM 370/138 to 370/148 range of machines; and also offered the Decsystem 1090 in the 370/148 to 370/158 range as well as its companion 1099, a dual-processor configuration.

As Minicomputer Use Gains

Mainframers Lose Ground With Federal Users

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. – The Federal Government moved slightly away from IBM and other large mainframers in 1976 as it increased its use of minicomputers.

While IBM kept its "king of the market" status, several smaller competitors gained ground in share of U.S. government business, the General Services Administration (GSA) found when it completed its latest inventory of federal DP equipment here recently.

IBM, Control Data Corp. and Univac lost percentage points in their respective shares of the $4.414 billion federal market in fiscal 1976, but Digital Equipment Corp., Hewlett-Packard Co. (HP), Varian and Data General Corp. (DG) showed share improvements over the fiscal 1975 inventory figures.

IBM was the vendor for 27% of the DP machinery used by the government in fiscal 1976, but the mainframer had provided 31.1% of that equipment in the previous year, according to the GSA inventory, which included figures from the Department of Defense.

The value of federal computers and related devices manufactured by IBM also slipped from $1.541 billion or a 35.8% share of a total market of about $4.302 billion in 1975 to $1.439 billion or a 32.6% share of the 1976 value of government installations, the inventory suggested.

CDC Univac Shares Slip

CDC and Univac showed similar dollar losses, although both of these firms increased the overall number of "units" including CPUs, storage devices, I/O equipment and terminals they have placed with the government, the inventory said.

In 1976, CDC had $727 million in equipment with the government, amounting to a 16.5% share of the federal marketplace. At the end of 1975, however, the company had $747 million worth of machinery or a 17.4% piece of the federal pie.

With $606 million or a 14.1% share in fiscal 1975, Univac slipped to $582.9 million or 13.2% of the federal dollars tied up in DP equipment in 1976, according to inventories for those years.

Taken together, IBM, CDC and Univac held 62.3% of the federal market this past fiscal year as opposed to 67.3% at the end of fiscal 1975, the GSA found.

IBM lost position in the number of units of DP equipment it has installed with the Federal Government. The 58,038 IBM units operating there in 1975 dwindled to 55,335 units in 1976.

In addition, the GSA inventory noted IBM sustained net losses in sheer numbers of devices for all equipment categories. There were 1,202 CPUs owned and leased from IBM in 1976, for example, indicating the additional 118 mainframes listed in 1975 have been unplugged.

This same trend was true of other IBM equipment: 8,421 storage devices were included in this year's inventory where 846 more were listed last year; 12,311 I/O devices in 1976 were 331 units stronger the year before; 4,965 terminals this year meant a loss of 102 from the previous year's 28,634; devices listed in the "other" category for 1976 were 1,306 less than those listed for 1975, the inventory showed.

In contrast to IBM, both CDC and Univac picked up the number of DP units they placed with the Federal Government during this past fiscal year.

CDC added 1,315 units of various types to its federal rolls for a 5.5% increase over the 23,809 total it had with the government the year before. Univac increased the number of its units by 1.4% from 20,034 units at the end of fiscal 1975 to 20,305 units.

Despite these gains, however, CDC's share of installed units slipped from 12.8% to 12.3% and Univac's share of the federal base dropped from 10.7% to 9.9%, according to the inventory.

Gains for Others

But what were losses for some were gains for others. Hard on the heels of Burroughs, which had a 5.8% share of the units and the value of the equipment installed with the government, DEC went from a total of 7,888 units in fiscal 1975 to 10,392 units, a 31.7% increase.

DEC's unit share of the federal market rose less dramatically, from 4.2% to 5.1%. With $99 million worth of machinery installed at the end of fiscal 1975, DEC had 2.3% of the federal dollars in DP. This year those figures have gone up to $122.8 million or 2.8% of the dollar share.

DG experienced a 44.8% increase in units installed in the government, going from 1,332 units in fiscal 1975 to 1,914 units in fiscal 1976. The dollar value and share of the federal installation base increased, too, from $12.1 million or a .28% share to $15.5 million or a .35% share.

HP went from 2,033 units with the government in 1975 to 2,808 units in 1976, a 39.1% increase in units. Its federal market share climbed from 1.1% to 1.4% or from $20.5 million to $28 million. HP increased its share of the federal base from .48% to .63%.

Key-to-Disk System Helps Co-Op Improve Productivity

FRIDLEY, Minn. – After replacing conventional card punching with a key-to-disk system, Midland Cooperatives, Inc. here said it is handling twice as many data entry transactions with a net reduction in total processing costs.

The wholesale supply and manufacturing cooperative, owned by and serving more than 700 retail cooperatives, has annual sales of more than $280 million and has had a DP department for 21 years.

Operated under the overall direction of manager Jim Krautkremer, the department processes general accounting, inventory control and newspaper circulation management applications on an NCR Corp. Century 201. The department is operated as a service bureau to handle accounting for the retail cooperatives which Midland serves.

Data entry was previously handled on nine conventional Univac keypunches, according to computer operations supervisor Bob Kemp. "If we were handling data entry on card punches today, we'd need another building to house the equipment and personnel," he said.

Extensive Study

To solve the problem, Midland investigated a number of different possibilities, according to Don Masterson, special projects manager. "We primarily looked for data entry equipment with maximum editing capabilities," he explained.

"We have operated on-line data entry systems since 1966, but decided that key-to-disk would be superior to on-line data entry in this application because of the greater speed of data collection."

Operation of a key-to-disk system at Midland Cooperatives, Inc. has enabled the co-op to double its transaction volume.

So, after extensive study, Midland installed a Univac 1900 Computer-Assisted Data Entry (Cade) key-to-disk, Masterson said.

At the time the key-to-disk system was installed, Midland was handling about 350,000 data entry transactions. Since then, total transactions have doubled to more than 700,000 a month, he stated.

Yet this doubled transaction volume is being handled with only a small increase in staff and at less cost, he indicated.

"We're now using the key-to-disk data entry systems to process 30,000 to 35,000 transactions or line items a day with one shift of nine data entry operators and a second shift of four half-time operators," he continued. "Previously, we needed nine full-time operators to handle half this volume.

"Consequently, we are processing twice as many transactions with the addition of only four half-time operators," he said. "By contrast, if we were still operating a conventional punched card data entry system, we would need a second shift with five or six operators and a supervisor to handle our current volume.

"Operation of the key-to-disk system has thus enabled us to double our transaction volume while, in effect, putting a lid on staff expansion," he explained. "This has been made possible by the increased productivity provided by the system."

Previously, for example, Midland's card punch operators averaged 10,000 to 11,000 keystrokes an hour. Now, trainees on the key-to-disk system average 12,000 to 14,000 keystrokes/hr, experienced operators consistently average 16,000 to 22,000 keystrokes/hr, and the lead operator goes as high as 29,000 keystrokes/hr, according to Masterson.

"Furthermore, we are achieving this increased productivity at less cost," he noted.

"The switch from card punching to key-to-disk operations, for example, is saving $1,400/mo in card and storage costs, more than double the additional cost of operating the key-to-disk system. In addition, costs are being reduced in several other ways, he said.

Operator Error Eliminated

"The editing capabilities provided by the key-to-disk system, for instance, have practically eliminated operator error with the result that the percentage of good batches going to the computer has increased from 5% to 75%," he said.

This has, in effect, shifted a great deal of editing from the computer to the key-to-disk system, freeing up the computer for other processing jobs, he reported.

"Mainframe time is also being saved because "the speed of data input to the computer is greatly increased," he added. "Previously, card data was input at 866 char./sec and it took about an hour a day. Now, data is entered at 84,000 char./sec (without card jams) and it takes only five or six minutes a day.

A separate, time-consuming operation of balancing card data on a tab machine has also been eliminated by the key-to-disk system.

"Due to increased batch accuracy, auditing time is also substantially reduced below what it would otherwise be if we were still punching cards," he said.

"Previously, 2.5 auditing clerks were required. Now, even though our volume has doubled – only three clerks or an additional half clerk are needed.

Service Greatly Improved

"In addition, the service or turnaround time we provide to our retail cooperatives is greatly improved," Masterson added. "The majority of transactions are now processed in 24 hours instead of three or four days."

Midland has internally developed about 50 different programs for use with the key-to-disk system. Prepared by a computer programmer, programs are made as sophisticated as possible to not only simplify data entry operations, but free up mainframe time, Masterson said.

"We design editing capabilities into the key-to-disk rather than mainframe system because it's simpler and saves time," he added.

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User Survey – Part 2

Study Cites Prime Factors in Data Base Organization

This is the second article in a two-part series dealing with distributed data entry. This article deals with file handling, control and data security.

By William J. Moore

Special to Computerworld

In addition to data entry and software editing, the Inforex, Inc. study of 50 users' plans for distributed processing uncovered five factors important to users organizing remote data bases: file structure, integration frequency, local control, error recovery and security.

System designers working with users must determine what files should be stored at remote sites. In making that determination, they should consider the trade-off between communications costs, if most files are centrally stored, and the costs of replicated on-line storage, if files are stored locally.

If files are to be stored locally, storage equipment must have expansion flexibility, from as little as 10M bytes to more than 200M bytes.

In addition to considering communications costs and storage costs, designers should consider the frequency at which local files must update or be refreshed by a central data base, according to the study.

After determining file location, system designers must determine the most appropriate file access technique for each application.

A distributed processing system should be able to support simple sequential, index sequential and direct access methods.

Regardless of the access method selected, the study indicated remote site managers will eventually want the option of creating their own formats and their own simple validation procedures.

Best of Both Worlds

The best of both worlds may eventually be a simple, easy-to-learn, limited instruction set which would allow remote site users to cope with changing document formats and access simple but powerful validation techniques as department procedures change and higher level systems do not change.

Distributed processing systems users will want the records they retrieve to be presented in a familiar format and will want the ability to conduct simple and complex searches for selected data with minimum keystrokes and little specialized operator training required.

That requirement implies the use of a predetermined set of commands which can be initiated with a single keystroke.

In addition, users will want multiple-file access to permit data to be retrieved and inserted in a record while that record is displayed on a terminal screen.

The act of updating that record should simultaneously update all pertinent records stored in other files. An automatic record protection system is also important so that simultaneous updates or deletions of a single record can be prevented.

Finally, users will want the ability to search for a record under alternate keys.

Reliable hardware and software will minimize the need to use error recovery techniques, and the quality and responsiveness of a system vendor's field service operation is a prime consideration for any system user.

But even the best systems fail on occasion, and system vendors should be responsible for providing a transaction logging scheme to inform local site managers of what records had been transferred or updated immediately prior to failure.

A good error recovery scheme will also include, for example, a facility for copying files from disk to tape.

Security Concern

Users are concerned with the ease with which they can enter and access data in a distributed processing system. They are equally concerned with the security of that data.

File security planning must take honest mistakes and dishonest mistakes into account. Class checks, range checks and table lookups with insertion are data entry features which aid security by preventing honest mistakes. Dishonest mistakes can be minimized by locking terminals and by protecting files with password techniques.

In addition, it should be possible to prevent certain terminals from performing specified functions, particularly updating.

The fourth basic element in any distributed processing system, in addition to data entry, data editing and file management, is a flexible communications capability.

The buzzwords associated with data communications make the topic appear confusing, but network design simply involves functional layers, beginning with communications channels.

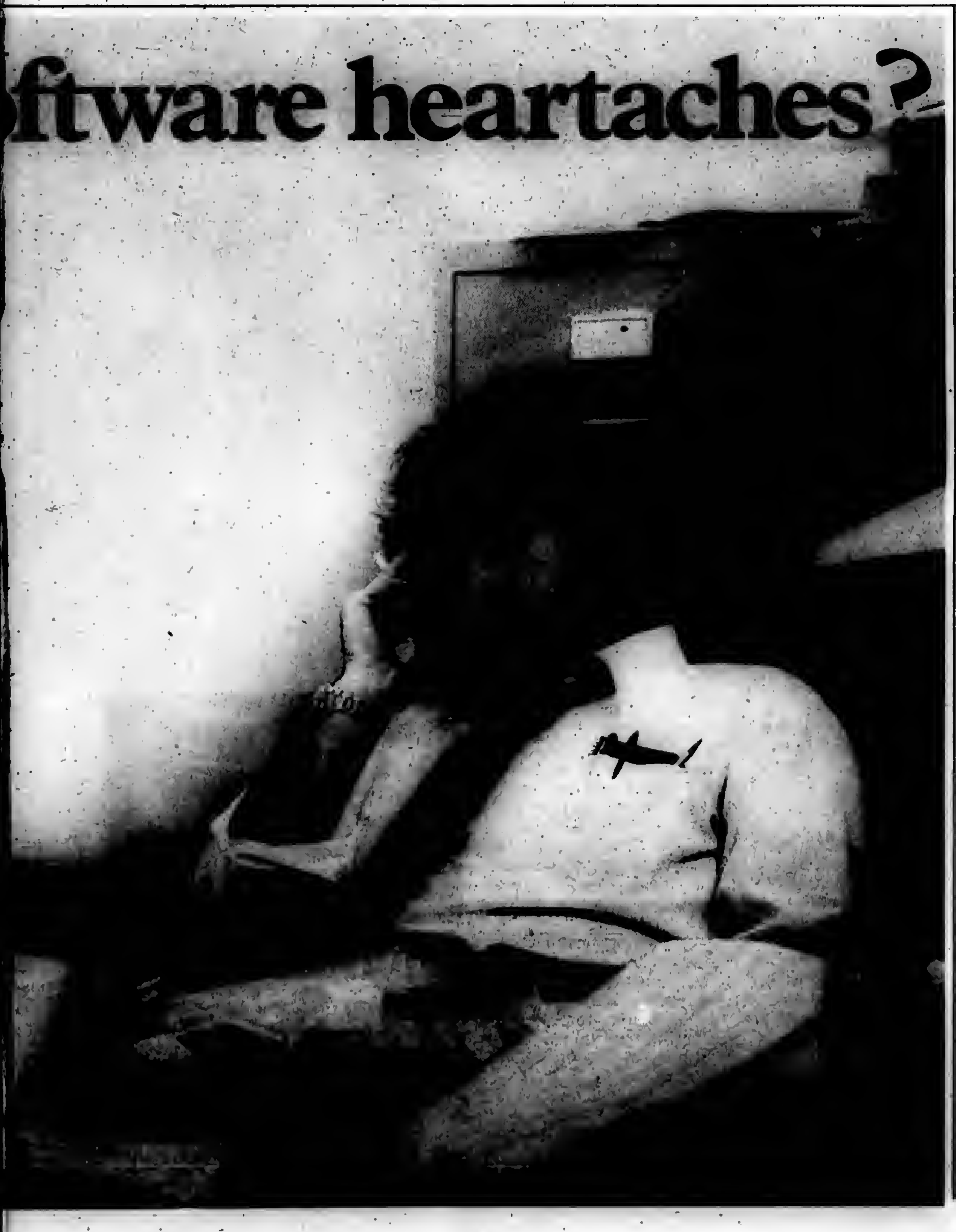
Regardless of the complexity of a communications network, communications channels will be point-to-point, multipoint or loop. The selection of modems, multiplexers and concentrators is a function of the network's performance requirements and users must be aware of price/performance trade-offs.

Terminals in a network must be flexible enough to handle a variety of applications and provide the ability to handle either Ebcdic or Ascii code in conjunction with an industry standard protocol.

Users should demand devices that have double buffering or the ability to perform an I/O function while performing a communications activity at the same time. They should also demand interleaving, which is tied to that philosophy of dual data paths and data compression and involves compacting strings of like characters in a data stream.

In addition to a network pass-through capability, distributed processing systems vendors should offer terminal-to-terminal message capabilities since many users want that convenience; a batch transfer capability, allowing terminals in a network to operate in remote batch or remote job entry modes; down-line software loadings; and the ability to poll a conventional multipoint or loop network.

Moore is vice-president of domestic operations at Inforex Inc., Burlington, Mass.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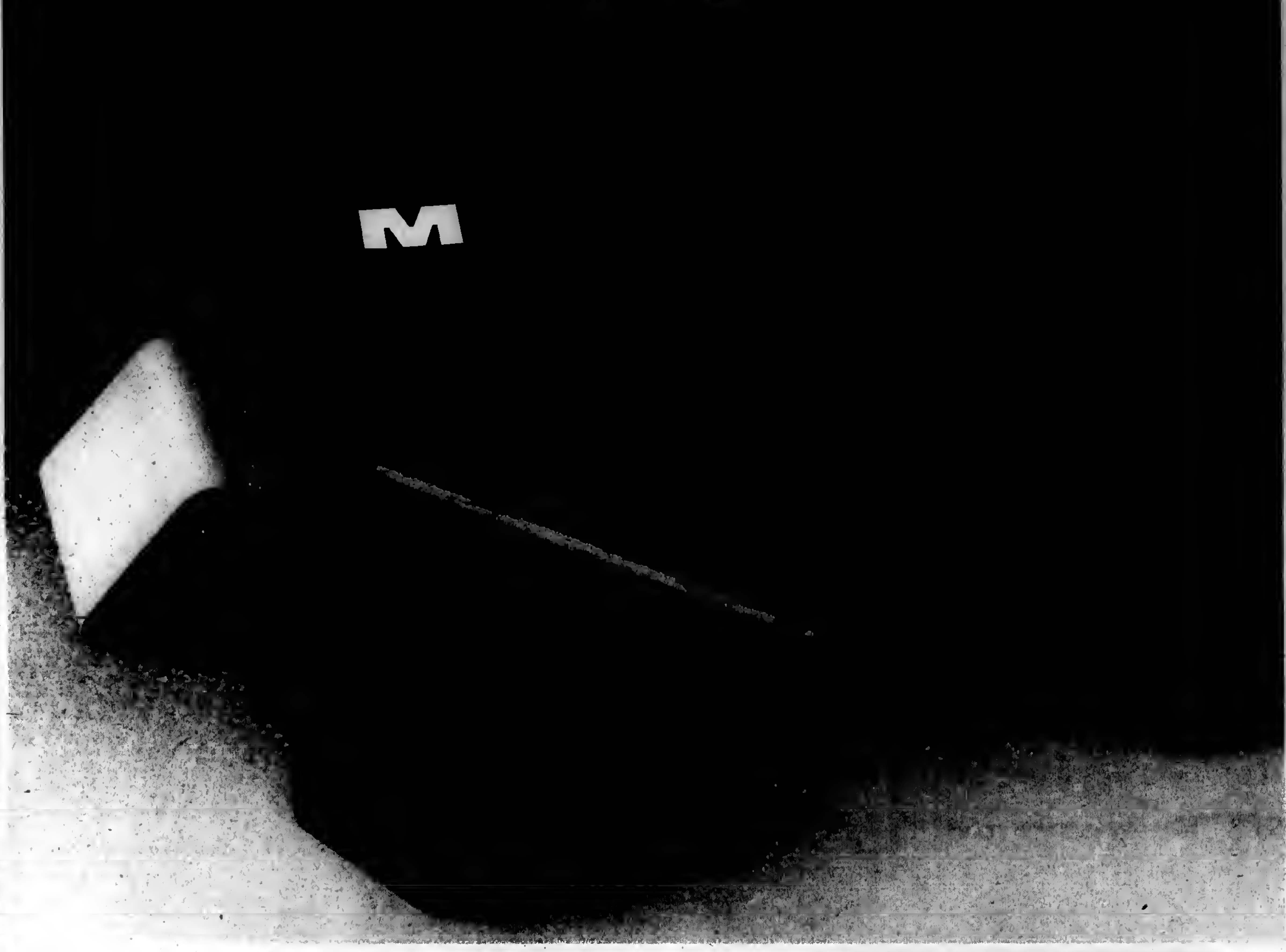

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Communications, Software Enhanced

Decentralized—Not Distributed—Minis Theme of '76

By Esther Surden
Of the CW Staff

Although the predicted move toward distributed processing never really took hold during 1976, many users did decentralize their DP operations.

While much lip service was paid to the theory that the entry of minis in end-user situations would obsolete the DP department, the data centers still had plenty of work to do after decentralization.

However, anticipating that future users will want to step up their distributed processing applications, the vendors took pains to introduce products with enhanced communications capabilities.

Small business systems also proliferated in 1976, giving the first-time user more confusing options.

And it was also the year in which Cobol became a reality for small systems as more and more business applications began to erase the image of this mini as only a scientific or laboratory system.

To fill in the gaps at the low end of the miniworld spectrum, micros continued to emerge in control situations.

Users continued to send messages to vendors stating service maintenance and standards were priorities.

And 1976 was the year in which IBM decided to get into the mini arena with the November introduction of its Series/1 (see story below).

Word Processing

It was also a time when data processing and word processing merged on already available systems. Digital Equipent Corp. was the first to introduce a combined system with an addition to its Datasystem line. Then, at the National Computer Conference (NCC) in June, IBM came along with a word-processing version of its System 32.

IBM also added models to its 3 line twice during 1976; January saw the introduction of the entry-level Model 4 and the 3/15D made its appearance in June.

A Look Back

Other Mainframers Active

The other mainframers on the mini scene were no less active. Honeywell Information Systems, Inc., for example, introduced a modular line of minicomputers with single-bus design in January. The Series 60 Level 6 systems were oriented to both end users and OEMs.

Burroughs Corp. made a splash with its B80 small business system. The B80 included a double-sided floppy, extending the capabilities of this type of equipment.

NCR also made an appearance in the small systems arena with the debut of its entry-level Century system and the NCR 499, an updated version of the 399 for small business users.

Mini Makers Bustled

The mini makers were also busy bustling products onto the user stage. Data General Corp. (DG) introduced a passel of products and made its entry into the microcomputer market with the Micronova series.

DG also extended its Nova 3 line and added a top-of-the-line Eclipse system with a complement of software for commercial transaction-driven applications.

DEC, the largest mini maker, had a fairly quiet year with expansions in the small business DEC Datasystems lines representing its primary emphasis. DEC provided a path for users with Series 300 systems to upgrade to its Series 500 line.

Hewlett-Packard Co. had two minicomputer entries last year, the 1000 Series and 3000 Series II. The 1000 Series, introduced in system form, essentially replaced the firm's former 21MX systems while the 3000 Series II was an updated, redesigned 3000.

Prime Computer, Inc.'s 400 system, comparable to the large DEC PDP 11/70 for time-sharing users, was introduced in February.

In April, Wang introduced a family of minicomputers that included a portable unit and workstations. April welcomed Logical Machine Corp.'s update of the Adam family of systems for the first-time user.

May's Entries

In May, Modular Computer Systems introduced its entry-level Modcomp II. Datapoint Corp. came out with a turnkey system and Computer Automation Inc. announced the Syfa system for distributed processing applications.

June was NCC month. Showing up at the conference were Harris Corp. with its Slash 6, Microdata Corp. with its Express, Four-Phase Systems with its distributed processing system and Modcomp Corp. with its IV/35 32-bit mini. Interdata also introduced systems on the high and low ends of its line.

And in November, Varian introduced a series of systems for multi-CPU nets.

The Main Event: An IBM Mini For the 'Sophisticated User'

By a CW Staff Writer

For the minicomputer user, the most significant event in 1976 was the November unveiling of the Series/1 from IBM.

This introduction marked the firm's first minicomputer fling and meant users had another choice. But this time, the new mini maker had a well-established reputation for support and service.

The Series/1 was no typical IBM system, however. It was designed for the "sophisticated user" and came almost completely unbundled from the control panel to the double-sided floppy disk.

When price comparisons came in, the Series/1 placed in the range of other medium-scale mini systems.

All this left a confusing picture for the user trying to decide which system to buy.

The first two Series/1 users chose the unit on the basis of service, which may be the key since mini users have been complaining for years about the lack of vendor support from the traditional mini makers.

But coming in without software, the Series/1 paid little heed to the users' other chronic complaint – that good minicomputer software is lacking.

The traditional mini manufacturers who worked hard on software last year indicated full complements of software will distinguish their products from the IBM mini.

Present, Future Developments

One thing is certain, however. Users should watch for future developments in the Series/1 line should this product follow the leads of other General Systems Division offerings.

These developments could come in the way of additional models. But for now, there are two processors, each with two submodels.

The Model 3A on one board fits into half of the width of a standard 19-in. rack and contains a card cage with four I/O slots. The Model 3B has 13 I/O slots. Both units feature a 64K-byte maximum memory storage capacity with an 800-nsec cycle time for the memory.

The Model 5A can accommodate up to 64K bytes of memory and has 8 I/O slots. The Model 5B can include up to 128K bytes of memory with three I/O slots. Memory cycle time for the Model 5 is 660 nsec.

Other developments could occur on the software level. While the Series/1 comes with a host of options and no standard higher level programming language, few observers said it will stay that way.

However, the modular pricing of such components, ranging from I/O devices to cabinets and control panels, is likely to remain a key Series/1 feature.

Another feature of the Series/1 that IBM spokesmen said will not change but many users would like to see altered is the "no discount" policy for multiple buys.

IBM's egalitarian "same price to all no matter the size" policy will keep the multiple mini buyer looking at other alternatives.

HIS Level 62 Reconfigured for Expandability

By Esther Surden
Of the CW Staff

WALTHAM, Mass. – Honeywell Information Systems, Inc. (HIS) has redesigned its Level 62 small-scale systems to allow users to configure their own systems instead of being limited to the set configurations previously available.

The firm has essentially replaced the CPUs of the 62/40 and 62/60 with a single CPU that has the same instruction repertoire and basic architecture of its predecessors, but features field expandability, a spokeswoman said.

Level 62 systems can now be expanded on four levels of instruction execution speed, in memory and in the variety of peripherals that can be added to the systems.

Current Level 62/40 and 62/60 users can upgrade their systems in the field to the new processor, HIS stated.

An upgrade would involve the addition of circuit boards in already provided space and the cost of the upgrade would depend on configuration.

HIS would not say what the processor cycle times were for the four announced speed levels. However, the spokeswoman noted the second level is 25% faster than the "basic processor" and about equal to the present 62/40 CPU, the third level is 67% faster than the basic processor or comparable to the 62/60 and the fourth is 117% faster than the basic processor.

The Level 62 memory can be expanded from 48K to 224K bytes of 4K-byte MOS memory. The system can be configured to operate in a card or cardless environment, in mono- or multi-programming mode or in a batch and communications environment, the firm said.

HIS announced the availability of additional peripherals for its small-scale systems.

Honeywell Level 62 Entry-Level Configuration

A 100- to 300 line/min printer with 120 standard print positions, low-capacity 20.13M-byte disk drives and a diskette subsystem with transfer rates of 31K byte/sec were introduced.

Each diskette in the subsystem accommodates 256,256 bytes of storage. The diskette drive subsystem can be located beneath the right-hand edge of the console, HIS said.

Also announced was software for the system, including Universal Total Level 2 data base capability and a remote text editor.

Applications programs include a production scheduling and control system package for the manufacturing industry and a comprehensive sales order processing system which handles the activities related to the acceptance and analysis of orders.

The remote maintenance capability previously announced for the Level 62 is provided with the system [CW, Dec. 13].

The additional maintenance processor allows the firm to determine the parts needed or amount of specialized training required to cope with a particular problem before a field engineer is dispatched, HIS stated.

An entry-level Level 62 configuration includes two disk units with 40M bytes of storage, CPU with 48K bytes of main memory, console printer, diskette unit and a 100 line/min printer.

The system costs $1,747/mo on a six-year lease or $83,907 if purchased.

A large configuration includes 480M bytes of disk, 80-column card reader that operates at 500 card/min, CPU with 224K bytes of main memory, control panel, 120 char./sec printer, diskette unit and 1,600-line/min printer.

The system leases for $7,429 on a six-year contract and costs $333,655.

HIS is offering one-, five- and six-year lease plans on both the CPU and peripherals, the spokeswoman noted from 200 Smith St., Waltham, Mass. 02154.

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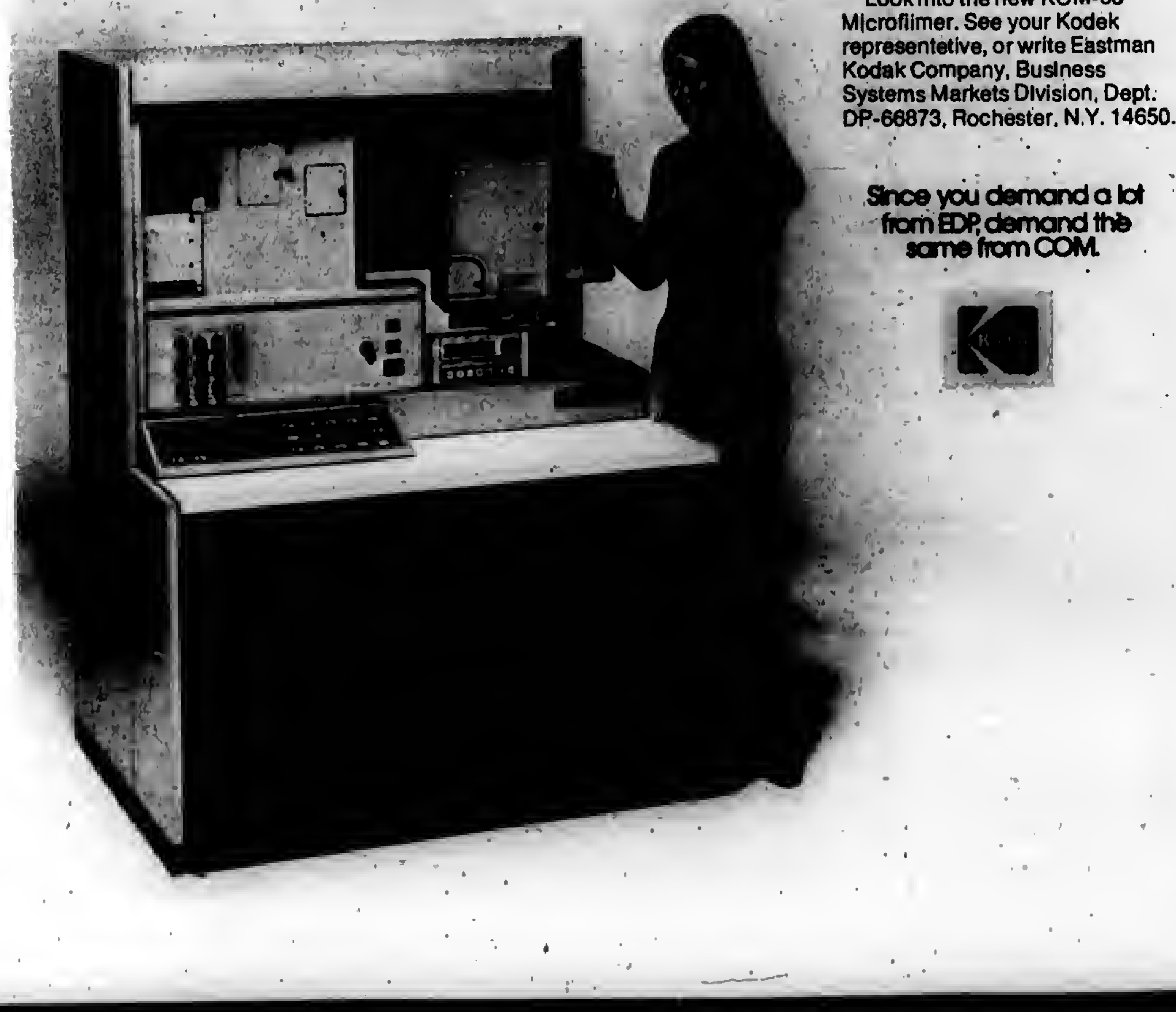


Mini System Tightens Controls For Schools' Business Office

TEWKSBURY, Mass. – A minicomputer at the school district here is providing increased control over source documents by allowing the documents to remain at the superintendent's office where decisions are made and inquiries are answered.

By keeping original purchase orders and vendor invoices at hand and entering data from them and payroll and budgetary transactions directly into the computer, the office staff retains full control over the paperwork and full responsibility for processing, according to John F. Ryan, assistant superintendent of schools for business.

Also, the equivalent of a clerk's time has been eliminated and errors, due mostly to excessive handling, have been reduced, he stated.

Equipped with an NCR Century 75 minicomputer for administrative and educational functions, the Tewksbury School District has installed an NCR 7200 data entry terminal in the superintendent's office for direct access to computer records.

"This means that the people responsible for the work are doing the actual inputting and can sight verify for accuracy," Ryan reported.

The terminal enables the office staff to access the system for information, such as the status of any one or all of the district's 375 operating accounts.

"We simply take the data files from the mini and put them on display," Ryan said.

Negligible Cost

For all this the cost is negligible, according to Ryan.

The alternative would have been for the district to replace a worn-out bookkeeping machine. The difference between that and the cost of the on-line batch system, when prorated over three years, is minimal, Ryan contended.

The system has also saved clerical time in the superintendent's office where personnel typed up bill schedules and vouchers and ran adding machine tapes connected with 5,000 to 6,000 vendor checks issued per year, he said.

Also eliminated was the six to 10 days spent every two weeks for one person to type up payroll and retirement documents, he added. There are 545 on the district payroll, including 400 faculty.

The district put a stop to the flow of much of the business paper that passed between the superintendent's office and the minicomputer six miles away, Ryan explained.

Needed to Ease Workload

Tewksbury, a Boston suburb of 25,000 people, has eight elementary schools, three educational wings (rented facilities), a junior high school and a high school. Total enrollment exceeds 6,900.

Like many school districts, Tewksbury was drawn to DP to ease the workload caused by an increase in student population and staff, according to Ryan.

In 1969, the district phased out some Tab Products Co. bookkeeping machines and manual functions and turned to an outside computer service and automated DP, he said.

The district installed a Century 50 minicomputer in 1973 after requesting bids, according to Tom Lovett, DP coordinator.

The NCR was chosen over systems from IBM, Burroughs, Wang and Honeywell because it had the "best hardware and software for the price," he added.

Under the direction of Lovett, the district has built up a computer file of personal histories on all students, kindergarten through 12th grade. The system also maintains attendance records and issues monthly registers.

Student schedules for grades 7 through 12 are sorted out by the system. In the junior high school, three buildings and a rotating schedule are utilized. Students in the senior high school are programmed for three continuous overlap sessions between 7 a.m. and 5 p.m., Lovett stated.

'Verbal Report Card'

The system at the school district provides a "verbal report card" prepared by the teachers, Ryan said. The teachers are given 39 printed comments from which to choose three that apply to each student, he explained.

Census reports for the state are prepared twice annually on the mini, listing each student's age, sex and school among other things.

DG Adds 3330-Type Disks

SOUTHBORO, Mass. – Data General Corp. (DG) has 96M- and 192M-byte IBM 3330-type disk storage subsystems for its Eclipse and Nova minicomputer lines.

Manufactured in-house, the systems are moving-head pack devices for the larger members of the DG mini line. Data density is 4,040 bit/in.; the data transfer rate is 806,000 char./sec.

The subsystems include error correction. An error-correcting code is added to data in every track sector, allowing the subsystem to correct all error bursts of 11 bits or less, the firm claimed.

Independent command and read/write channels within the subsystem can be multiplexed in dual-processor systems to allow the subsystem to accept and process a seek instruction for one drive while the control is servicing a read or write instruction for another drive, according to DG.

The control can also store a read or write instruction for a drive while that drive is seeking a location, the firm said.

A reserve command feature allows the user to reserve one of the drives for the processor selecting that drive without restricting access to other drives by the other processor; this is beneficial in implementing privileged file structures for security in large data bases, a spokesman explained.

The systems are supported under the recently introduced Advanced Operating System as well as under mapped and unmapped versions of the RDOS for multiterminal or batch processors, DG said.

The 96M-byte subsystem costs $24,950; the 192M-byte subsystem costs $29,950 from DG at Route 9, Southboro, Mass. 01772.

Tealtronic Offers Series 2500 For Entry-Level Business User

CRANFORD, N.J. – Two entry-level, diskette-based small business systems have been introduced by Tealtronic of America, Inc.

The Series 2500 includes the Model 2500 billing and accounting system for stand-alone business applications and the Model 2541 data entry system primarily for remote data entry environments, the firm said.

The systems are said to be in the performance range of the Datapoint 1100 diskette series, Digital Equipment Corp. Datasystem 310, IBM 3741 data entry device and Wang Laboratories WCS systems.

Both systems are based around a microprogrammed pico processor which is said to permit simultaneous execution of a variety of logic and I/O operations.

Up to 32 devices can be accommodated by a Series 2500 system, Tealtronic stated.

Memory for the systems is 600 nsec MOS. Up to 64K bytes can be accommodated in 4K-, 8K- and 16K increments.

The Series 2500 uses diskettes that are IBM 3741-compatible. Up to four diskette drives can be included.

Operating under the Tealtronic-supplied Interpreter control program, the Series 2500 uses Application Control Language (ACL).

The basic 2500 workstation processor with CRT and 16K of user memory costs $8,500. A diskette drive module with two drives costs $2,750.

A variety of printers can be attached to the system, Tealtronic said from 14 Commerce Drive, Cranford, N.J. 07016.

Olivetti P6060 Mini Designed for Novices

NEW YORK – The P6060 Personal Minicomputer from Olivetti Corp. of America was designed for "noncomputer people who want an interactive and intelligent device on their desk," according to a spokesman.

The system includes up to 80K bytes of random-access memory; a single- or dual-floppy disk unit; a 32-character CRT; an 80 char./sec, 80-column thermal printer; an alphanumeric keyboard with 10-key pad; and a monitoring console.

Connects to Disk Unit

The P6060 can accommodate up to eight input and eight output devices or eight combined I/O units via two standard character-serial I/O channels. An RS-232C interface allows connection to a larger remote system for time-sharing applications, the company noted.

In addition, a direct memory access channel is available to allow the P6060 to connect to a 10M-byte moving-head disk unit.

Programmable in Olivetti's Extended Basic, the system can use programs from existing Basic libraries, the firm said.

A basic configuration with 8K of memory, one floppy disk and the thermal printer costs $7,950. Olivetti is at 500 Park Ave., New York, N.Y. 10022.

Micro Diskette Drive Available for OEMs

NEWPORT BEACH, Calif. – An OEM miniaturized diskette drive from Wangco, Inc. accepts a 5.25-in. diskette for microcomputer applications, the firm said.

The Model 82 accepts hard-sectored diskettes of 10 sector/track or a modified IBM-type soft-sectored format, the firm noted.

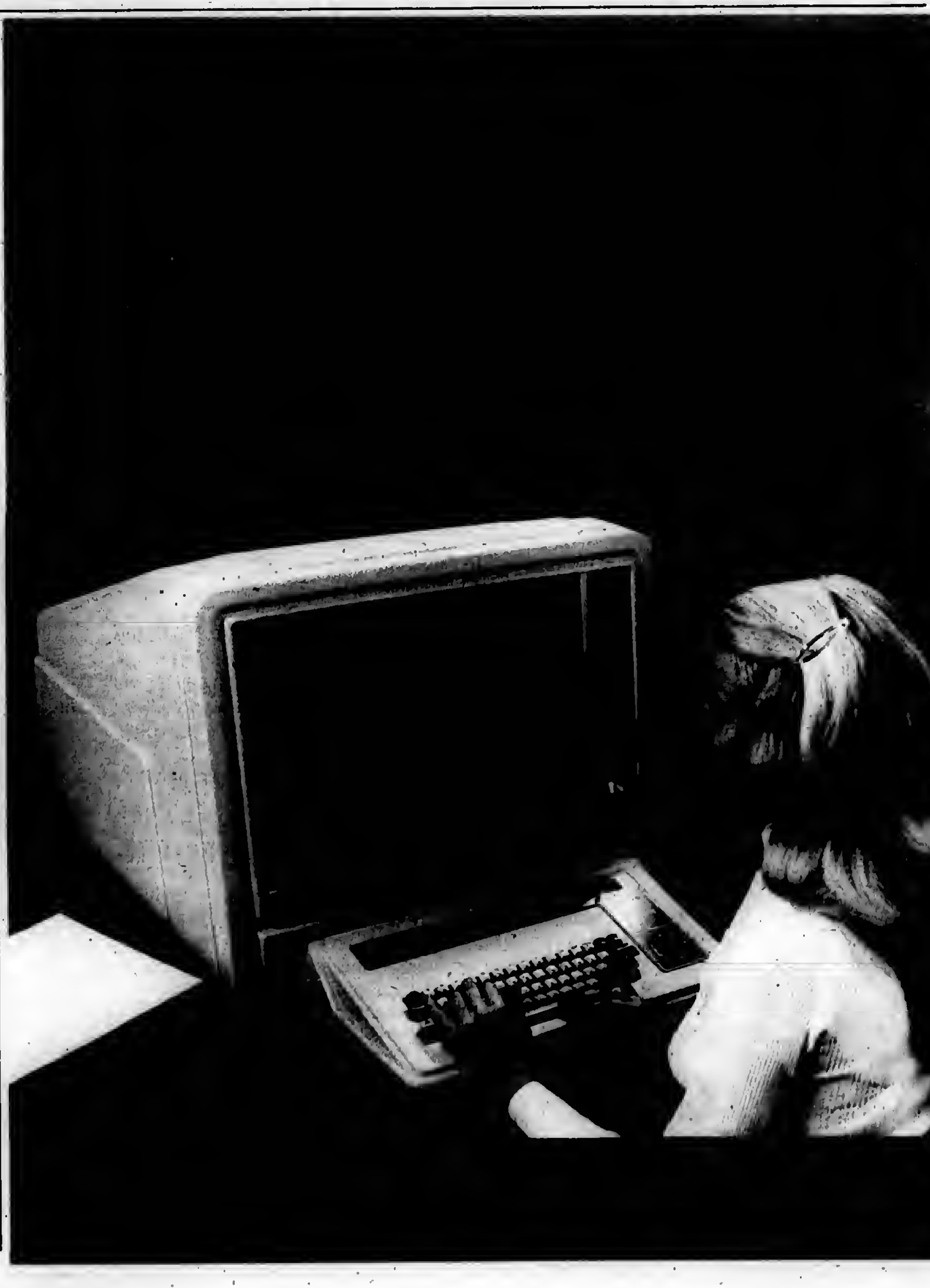
Data storage can be extended "as high as 498.8K bytes per disk" via double-density encoding techniques and an optional feature that permits recording on both sides of a standard diskette, the company claimed.

Extra Storage

The basic, unformatted capacity of the Model 82 is 109.4K bytes on 35 tracks. To expand that capacity without alteration of media or encoding, the user can address an additional five tracks on any diskette for a total of 40 tracks and storage capacity of 124.7K bits, Wangco said.

The track-to-track access time is 30 msec; random average seek is 370 msec.

The basic unit sells for about $300 in OEM quantities from Wangco at Suite 204, 2503 Eastbluff Drive, Newport Beach, Calif. 92660.



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Some Ingenuity, a Small System Help Non-DPer Open DP Service

BUCKINGHAM, Pa. – With a bit of ingenuity and a small business system, even a nonprogrammer can open a service bureau, according to Dick Paulus of Buckingham Business Services here, who said he did just that.

Paulus knew his business – fuel oil distribution – but nothing about computers when he decided he needed a more powerful device than the accounting machine he was using to provide payroll services to fuel oil distributors.

The logical choice was a minicomputer, he said. Paulus looked at several systems from Burroughs Corp. and Basic Four Corp. before deciding to get a Microdata Corp. Reality system.

Ease of programming was the primary reason for the choice, Paulus said, because he needed a system that a nonprogrammer could use. Helped by the dealer in learning the system's language, Paulus designed a package for fuel oil dealers.

Buckingham's fuel oil system provides service in four general areas: budgets (including estimating budget payments for the new heating season as well as providing collection data), credit, delivery and service.

Delivery tickets printed by the system include such information as degree day due, mid-point to run out and run-out degree day in addition to the usual customer name, address and credit information. Buckingham's customers get a daily transaction report in account number order, a summary of daily activity by product code and the net change to accounts receivable, the actual accounts receivable balance and a list of customers who are overdue for delivery.

At month-end they get a delivery efficiency report showing by tank size the average quantity delivered, an aged trial balance for amounts up to 120 days as well as outstanding finance charges, monthly statements separated into budget and regular and a monthly summary which lists every product code having had a transaction that month, the corresponding quantity and the net change to accounts receivable.

Linked by Phone Lines

The first customer came on-line in October. The Philadelphia fuel oil dealer keys into Buckingham's computer, some 20 miles away here in suburban Buckingham, via ordinary telephone lines.

The present Reality system, which consists of 24K of core memory, a 10M-byte disk, an 800 bit/in. backup tape, two Prism CRTs and a 165 line/min printer, can accommodate up to four dealers, Paulus said.

When business warrants it, Paulus plans to expand the system to 64K of core and a 40M-byte disk – or more, if needed. The system's expansion capability was another selling point for Paulus, he said.

Small-Sites Overlook Problem of Humidity

By Floyd W. Carlstrom
Special to Computerworld

MADISON, Wis. – One problem frequently overlooked in smaller DP installations is the level of relative humidity in the DP department, especially during the heating season.

When cold, outdoor air is heated, it has a greatly increased capacity to hold moisture. For example, if the outdoor relative humidity is 70% and the outdoor temperature is 20° F, the indoor relative humidity in a building that has no humidity added is about 10%.

That's far from the 40% to 50% range that many equipment manufacturers recommend.

When the relative humidity is maintained at 45%, static electricity is greatly reduced; punch cards and business forms don't stick together and cause feeding problems.

Proper humidity also prevents tapes from expanding or curling.

Because DP systems generate heat, the air in the room tends to be even drier than normal. Frequently the heat load is great enough to call for cooling equipment, even during the normal heating season.

With the problem of dehumidification or moisture being removed from the air, the "dry air" problem is aggravated. The installation of a humidifier can help solve these problems.

Carlstrom is with Research Products Corp. in Madison, Wis.

Burroughs users! Now you can eliminate your Achilles heel.

Would a large international bank and thousands of other commercial operations throughout the world use Burroughs computers unless they were very good? Obviously not.

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Of course, printing quality and total output are not just Burroughs problems. We are delivering our printer controller to users of CDC, DEC, Univac, Xerox and other computers to solve similar problems. Commercial, educational, scientific, military and computer service bureaus are among our printer controller users.

For multi-vendor installations we can add a switch to your controller to allow you to connect the IBM-1403 to either of two different computers.

You can rent, lease or buy both the printer and controller. For full information, call or write Joe McDonough, Grumman Data Systems Corporation, 45 Crossways Park Drive, Woodbury, New York 11797. (516) 575-3034. Telex: 96-1430. TWX: 510 221-1842.

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COMPUTER INDUSTRY

CI Notes

CCIA Offering Daily Digest Of Calcomp vs. IBM Trial

WASHINGTON, D.C. – The Computer and Communications Industry Association (CCIA) is offering a daily Trial Monitor service to keep interested persons up-to-date on happenings in the California Computer Products, Inc. (Calcomp) vs. IBM antitrust trial.

The digest of transcripts, prepared by Timothy J. Shearer, a Washington, D.C., attorney specializing in antitrust law, is available three days after each trial day.

The price of the first 120 days of Trial Monitor is $550 to CCIA members and $675 to nonmembers or $7.50 for a single day.

The service is available free to the press. Additional information is available from Robert Negran at CCIA, 1911 N. Fort Myer Drive, Rosslyn, Va. 22209.

Amdahl in West Germany

SUNNYVALE, Calif. – Amdahl International has formed Amdahl Deutschland GmbH, based in Munich.

The firm expected to deliver its first system in December to Max Planck Gesellschaft zur Forderung in Munich.

A second 470V/6 was also slated for December shipment to Germany.

Supershorts

Centronics Data Computer Corp. will obtain mechanical assemblies for its forthcoming medium- and high-speed line printers from two subsidiaries of Hitachi Ltd.

– – –

Lear Siegler, Inc. delivered its 20,000th CRT terminal within six months of producing its 10,000th unit.

– – –

Milgo Electronic Corp. has formed a Brazilian manufacturing firm in conjunction with Coencisa Construcoes Civis Ltda. The new firm, of which Milgo owns 49%, will make and market its data communications products in Brazil.

– – –

The Communication Products Section of the Canadian General Electric Co. Ltd. has been selected as Canadian distributor of Applied Digital Data Systems, Inc. products.

Business Improved

Lines Blended, Trends Continued in '76

By Molly Upton
Of the CW Staff

The year 1976 could be characterized as a time in which lines between formerly distinct areas of the DP environment blurred and perhaps even merged.

Where are the cutoff points between mainframes and minis? Minis and micros? DP and communications?

It was a good year for most firms, booming for many and notable for the continuation of trends evident last year.

In the services area, there seemed to be an increasing awareness that the competitive edge lies in specialized services rather than raw time. Consolidation continued apace, marked by larger time-sharing firms expanding their base of operations through acquisition of regional time-sharing firms as well as batch bureaus.

Software firms saw the volume of both utilities and applications packages grow. International Data Corp. estimated revenues of packages in 1976 would be $350 million, growing to $465 million in 1977.

International Computer Programs, Inc. added 29 packages to its $1 Million Club in 1976 and 35 to the $2 Million Club.

Although the impact has yet to be seen, IBM and Honeywell Information Systems respectively entered and returned to the mini area with flourishes.

In the peripherals area, several vendors that had watched Centronics Data Computer Corp.'s earnings grow over the years decided printers are perhaps where the peripheral action is and entered the fray.

Blurring Distinction

Mini makers indicated they're not sure they want to be called minicomputer firms any more, since their products can carry substantial power as well as price tags.

Just as the line is blurring between mainframes and minis, so too is the distinction between minis and micros. Many minis incorporate micros, not only as I/O controllers but as the heart of the systems.

Speaking of incorporating micros, some mini firms made real the long-espoused philosophy of vertical integration by setting up their own semiconductor facilities and incorporating these yields into their product lines.

Data General claimed to be producing the chips forming the Micronova and Digital Equipment Corp. dabbled in semiconductor efforts.

The Hewlett-Packard Co. (HP) also has its own lab. Some observers suspect its new System 1000 and the yet-to-be-introduced CPU in that system incorporate micros of HP design and production.

Minis also found a growing outlet in systems houses that put together small business systems, manufacturers reported.

A Look Back

As a reflection of the blending of DP and communications, the Computer Industry Association added "Communications" to its name.

Bell's Dataspeed 40/4 raised such a flap it made IBM a bedfellow with the Computer and Communications Industry Association and The Computer Business Equipment Manufacturers Association.

In other areas, IBM apparently became the lone occupant in the territory of ink jet printing used with DP, which some observers expect to heavily impact certain segments of the industry.

IBM sneaked the product in with a new word-processor version of the System 32 and also began offering ink jet printing on a machine marketed to the office equipment buyer.

The large-scale peripherals business seemed to be more sedate in 1976 than in the past. Although several firms announced they would follow IBM's 3350 announcement with their own version of the high-capacity drive, very few brought out such a product and at least one, California Computer Products, Inc., renounced the effort.

Increased Leasing of Terminals

There seemed to be an increasing number of firms engaged in leasing terminals. Many of these offered shorter term leases than did the manufacturers, thus providing users with flexibility.

In terms of methods of doing business, IBM continued to observe a large portion of its quarterly revenues were being generated from outright sales rather than leases.

But in the area of smaller machines, IBM's tradition of leasing, carried on by the 32, may have impacted other manufacturers' revenue bases.

For instance, early in the year, Burroughs noted it was leasing an increasing portion of its small systems base.

Keep AT&T Out of EFT Market, Adopt Standards, CCIA Urges

SAN FRANCISCO – The Computer & Communications Industry Association (CCIA) has asked the National Commission on Electronic Fund Transfers (EFT) to establish a standards commission and to foster competition by excluding AT&T and its subsidiaries from participation in the EFT arena.

A federally chartered Computer and Communications Standards Board could provide the impetus for standardization in the EFT area that will allow broad compatibility of equipment at less cost to the consumer, CCIA President A.G.W. (Jack) Biddle told the commission at a recent hearing here.

The other alternative, Biddle said, is a monopoly such as the present one in the telephone area.

However, Biddle stated, a monopoly in EFT is not justified since the supplying of EFT systems "bears none of the traditional earmarks of a natural monopoly."

The systems are little more than "networks of terminals and business computers . . . EFT systems in general should be regarded as DP services and AT&T and its subsidiaries should be kept out of this market," he said.

"This commission needs to be made keenly aware of the serious consequences that derive from any decision which allows Bell to provide EFT-related services," Biddle warned.

Once Bell enters the EFT market, most competitors will be "threatened with extinction due to Bell's cross subsidies, predatory pricing practices and passing on of its costs to the telephone rate payers," Biddle contended.

The major problem facing the commis-

(Continued on Page 36)

Datapro Salutes the Software Winners!

Here are the top 38 software packages out of 1,446 as determined by user ratings in Datapro Research Corporation's 1976 survey of 30,000 computer system users.

1976 Datapro Software Honor Roll

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CA-SORT II Computer Associates, Inc.
CYTOS DNA Systems, Inc.
DFAST Oxford Software Corporation
DIOPEN IBM Corporation
DISKPLAY Boole & Babbage, Inc.
Disk Utility System Westinghouse Electric Corporation
DYL-250 Dylakor Software Systems, Inc.
DYL-260 Dylakor Software Systems, Inc.
EASYTRIEVE Pansophic Systems, Inc.
1130/FORTRAN DNA Systems, Inc.
1130/SORT DNA Systams, Inc.
EPAT Software Design, Inc.
Fast/Dump/Restore Innovation Data Processing, Inc.
FMAINT Software Design, Inc.
GRASP Software Design, Inc.
IDMS Cullinane Corporation
IMAGE Hewlett-Packard Company
IMSL IMSL, Inc.
LIBRARIAN Applied Data Research, Inc.
LOOK Applied Data Research, Inc.
Minicomm Informatics, Inc.
Optimizer II Capex Corporation
PANVALET Pansophic Systems, Inc.
RELO-PLUS Universal Software, Inc.
RPG II (360/370) IBM Corporation
SAS SAS Institute, Inc.
SLICK NCI, Inc.
Software 1040 SAB, Inc.
SPSS SPSS, Inc.
SYNCSORT Whitlow Computer Systems, Inc.
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CCIA's Biddle Asks Commission To Keep AT&T Out of EFT Mart

(Continued from Page 35)

sion is that there is "no longer any technological distinction between DP and communications. The long-heralded marriage between computers and communications [is] now finally consummated in EFT," Biddle remarked.

He suggested the commission propose an amendment to the Communications Act of 1934 that would preclude AT&T's entry into the EFT marketplace as a supplier of EFT equipment or services. The amendment would also allow common carriers to supply EFT equipment or services only through separate arms-length subsidiaries.

"The Computer and Communications Standards Board would have equal representation from suppliers, providers, users, the general public and the government to act as a focus for national and international voluntary standards activities in EFT," Biddle said.

The Institute for Computer Sciences and Technology could act as technical support and advisor and its funding be made available to the new board, Biddle suggested.

As in the DP industry, the existence of standards in data communications "would clearly tend to increase competition rather than to restrict it," Biddle stated.

"Without standard protocols, the user will have to bear the burden of costly interfaces or be forced to look to a single supplier for all his communications needs," he added.

Biddle warned against the incursion of de facto standards which threaten EFT competition and cited AT&T and IBM as sources of these types of standards.

For competition to be effective in each area of EFT, standards are needed for four levels of access:

- User interfaces.
- Terminal-to-network interfaces.
- Network-to-computer interfaces.
- Network-to-network interfaces.

Network access itself has four levels of protocols: physical circuit, link control, packet level and application level, he added.

Telex Signs to Buy UTC Terminal Arm

TULSA, Okla. – Telex Corp. has signed a definitive agreement with United Technologies Corp. (UTC) for the acquisition of UTC's Terminal Communications, Inc.

The unit, which manufactures remote data terminals for communication applications, will be sold to Telex Computer Products, Inc. and will operate as a wholly owned subsidiary.

The agreement calls for an undisclosed amount substantially in excess of $3 million and some notes, according to J.D. Bailey, Telex vice-president.

The unit will continue to operate in its North Carolina facility, he said.

The firms have many of the same installations, he observed, adding the move will be a "synergistic saving." Service for terminals will be provided by a combination of forces from both firms, he said.

Despite Telex's past troubles with IBM in the plug-compatible market, Bailey said there is no reason why Telex should abstain from entering new markets because of IBM's presence.

IBM 138, 148 Sold Quickly: IDC

WALTHAM, Mass. – IBM amassed 2,250 orders for its 370/138 and 1,500 orders for its 370/148 within a week of their introduction, according to estimates contained in a census prepared by International Data Corp. (IDC) and published in *EDP Industry Report*.

The 138s and 148s therefore emerged from the nest not as fledglings but as surefire sellers, the findings of the market research firm indicated.

In comparison, the older 135 accounted for 5,350 installations worldwide with 2,550 in the U.S., according to the census, dated July 1, 1976.

There were 3,490 IBM 370/145s installed at that time, 1,820 of them in the U.S., IDC estimated.

But IBM wasn't the only manufacturer with new systems for which it received a bundle of orders. Burroughs amassed about 3,300 orders for its B80 and 50 orders for its B2800, IDC estimated.

An almost new system, the Digital Equipment Corp. Decsystem 2040, was first installed in June and had 20 orders pending as of July 1, IDC indicated.

The IBM 3/4, also first installed in June, totaled 70 installations with 500 orders, according to the census.

IDC estimated Honeywell Series 60 units are generally more populous outside the U.S. than inside while IBM systems are more evenly split between international and domestic distribution.

For instance, the census listed 1,510 Series 60 machines outside the U.S. and 422 in the U.S. Of IBM 370s, 9,253 were in the U.S. and 10,588 outside the U.S.

DEC Expands, But Not in France

MAYNARD, Mass. – Digital Equipment Corp. is expanding in many directions and locations, but apparently not in France.

The French government indicated to local officials in Annecy-le-Vieux it has rejected DEC's bid to build a 30,000 sq-ft plant there, according to a spokesman for the vendor.

DEC is looking at several other possibilities on the European continent, stockholders were told at a recent meeting.

In the U.S., however, DEC's plans are proceeding apace. The firm has bought 205 acres in Augusta, Maine, where it plans to build a minimum of 100,000 sq ft for manufacturing modules and subassemblies.

In Hudson, Mass., DEC plans to build a facility with a minimum of 100,000 sq ft.

Groundbreaking on a 600,000 sq-ft building in Merrimac, N.H., was scheduled to occur early in December. This will house some administration, engineering and marketing organizations.

In Salem, N.H., construction is under way on a 650,000 sq-ft facility to house final systems assembly and testing.

The firm plans to build a 130,000 sq-ft facility in S. Burlington, Vt., for the manufacture of subassemblies.

Meanwhile, in the western U.S., DEC completed the first phase of its Phoenix plant in July and the second portion is nearing completion.

DEC has bought 360 acres in Colorado Springs, Colo., on which it plans to build a facility for peripherals.

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Corporate Casualties

Datran

By Toni Wiseman
Of the CW Staff

The Data Transmission Co., better known as Datran, passed away on Aug. 19 of this year. It had been suffering from long-term financial problems and competitive complications.

The youngest brainchild of Sam Wyly and a member of the Wyly Corp., Datran will be remembered as the first switched digital data service, a memory stamped in the minds of its users who were indescribably shocked by the sudden death rattle with only a few week's notice.

A two-week remission, thanks to Federal Communications Commission (FCC) intervention, did little to assuage users' fears and disillusionment.

The specialized common carrier had nearly succumbed earlier in the year, but recovered after a cash infusion from Walter Haefner Holding AG of Zurich, Switzerland.

Datran's user base was never large, totaling less than 150 at its peak, but the company will always be remembered as a feisty competitor, willing to take on the largest telephone and telegraph carriers.

"Our efforts to secure financing necessary to continue the business of Datran were seriously impaired as a result of AT&T's action to institute services at rates which were about 40% below Datran's rates," Sam Wyly said in his bankruptcy statement.

"In June of this year, administrative law judges of the [FCC] found certain of such AT&T rates to be unlawful, unreasonably low, anticompetitive, predatory and specifically designed to eliminate Datran.

"That Datran has indeed been eliminated is now a fact. The cause has been documented. We now look to the court for justice in this matter," Wyly said.

Wyly has, in fact, charged AT&T with "first-degree murder." The suit, filed in the U.S. District Court in Washington, D.C., seeks $285 million in damages.

Beyond these charges, there is the reputation of the business which has been severely damaged. It will be harder and harder after this to convince users who have already been burned once that there is an alternative to Bell, some eulogizers believe.

While users had been fully aware of the financial instability of the fledgling carrier, most had been willing to take a "calculated risk" and take advantage of its capabilities rather than being restricted to "more conventional" types of service.

Datran's passing was also mourned by other carriers and some modem manufacturers – the former because of their fear of contamination by association and thus a similar fate, the latter because Datran had been a good and valued friend, not to mention customer.

Singer Business Machines

By Toni Wiseman
Of the CW Staff

The computer industry was saddened by the passing of a venerable trouper this year when Singer Business Machines (SBM) lost its battle against the ravages of growing costs and competition.

The Singer Co. announced in January it would withdraw over the year from the manufacture and sale of its SBM product line, including retail terminals and data systems.

In his funeral oration, Singer Co. Chairman Joseph B. Flavin said that "although the potential of the division is still significant, its continued operations are no longer consistent with Singer's overall aims and financial resources."

At the time of its death, SBM accounted for only 11% of Singer Co.'s total 1974 revenues of over $2 billion. In terms of losses, however, the division was a major contributor.

As a result, Singer Co.'s 1975 financial statement included provisions totaling about $400 million for expenses and write-downs, $325 million of which was directly attributable to SBM.

The firm's withdrawal from the computer and point-of-sale (POS) market followed the 1974 termination of its electromechanical billing and accounting product line, which led to a $30 million write-off and a $10.1 million net loss in that year.

While SBM's installed base may not have been overwhelmingly impressive in terms of value per system or even total installed value, the number of Singer users was impressive.

These users, left somewhat in the lurch by the sudden termination announcement, rapidly became complacent when they got the feeling the support promised by Singer over the next five years would be sufficient for their needs.

It was the best equipment for the money, some users recalled.

After long weeks of speculation and rumor, Singer did indeed sign an agreement turning over maintenance and customer support functions to TRW, Inc.

The arrangement included a pledge by TRW to continue the manufacture of the Singer System Ten as well as to provide software maintenance and, in some cases, enhancements for systems already in use.

Overseas, Britain's International Computers Ltd. (ICL) bought manufacturing and marketing rights to the System Ten and POS systems. The agreement provided for the transfer of the main Cogar facility, which manufactured the System Ten, to ICL at the end of the year.

HIS Regroups Into Three Units

MINNEAPOLIS – Honeywell Information Systems, Inc.'s (HIS) North American Operations have been reorganized to focus on product-oriented divisions.

The move concentrates marketing efforts on the U.S. and Puerto Rico, establishes three profit centers and combines federal and domestic marketing and field engineering into a division.

"Successful growth throughout our computer business has caused us to restructure our operations in manageable, product-oriented divisions that will permit us to fully capitalize on future opportunities," according to C.W. (Clancy) Spangle, HIS president. The changes were effective Jan. 1.

Three Profit Centers

The three profit centers are the Large Information Systems Division in Phoenix and the Small/Medium Information Systems Division and the Marketing and Services Information Systems Division, both headquartered in Waltham, Mass.

The new U.S. Information Systems Group, successor to the North American Operations, is responsible for marketing and servicing in the U.S. and Puerto Rico.

Responsibility for marketing in Canada and Mexico was allocated to the Pacific Operations Group, which will be headquartered in Minneapolis.

Previously the organization included federal systems, DP operations, field engineering, Canadian systems and North American systems, which had Phoenix, Boston and computer engineering reporting to it, a spokesman said.

The Large Information Systems Division's responsibilities include product planning, engineering and manufacturing of large systems for HIS markets worldwide. This division will also handle the Multics program and development and support of Xerox computer systems serviced by HIS.

The Small/Medium Information Systems Division has two parts. The Minisystems and Terminal Operation is responsible for product planning, engineering and manufacturing of Level 6 minis and certain terminals for worldwide HIS markets. The General Products Operation is responsible in the U.S. for engineering support and refurbishment of all small and medium systems and peripherals.

Marketing

The Marketing and Services Information Systems Division is responsible for marketing and systems support for all HIS computer products in the U.S. and Puerto Rico, including the Xerox products serviced by HIS.

The Federal Systems Operations, responsible for computer sales to the U.S. government, is also part of this division.

Lee E. Sheehan will head the U.S. Information Systems Group; he previously was North American Operations vice-president and general manager.

Other than Sheehan, most appointees saw recent service in areas different from those of their new appointments.

Norman N. Feldman, currently vice-president of the Product Management Operation in Minneapolis, was named vice-president and general manager of the Large Information Systems Division. Feldman is a former vice-president of the Phoenix Computer Operations.

James R. Pompa, vice-president and general manager of Federal Systems Operations, will become vice-president and general manager of the Small/Medium Information Systems Division.

Seymour Kraut, vice-president of Phoenix Computer Operations, is relocating to Waltham as vice-president of the Minisystems and Terminal Operation and Robert F. Anderson, vice-president of Strategic Planning in Minneapolis, is relocating to become vice-president of the General Products Operation.

Richard R. Douglas, formerly vice-president of DP Operations, will be vice-president and general manager of the Marketing and Services Information Systems Division.

Michael J. Keliher, a vice-president in the Product Management Operation in Minneapolis, joined this division as vice-president of Federal Systems Operations.

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Sealed proposals will be received by the CDPA, 508 Robert E. Lee Bldg., Jackson, MS, 39202, up until 2:00 p.m. 1/24/77, for the following data processing equipment:

Request for Proposal No. 272 for the purchase of an additional 64K words of memory for an existing DEC 1077 computer system with 192K words of core memory.
Request for Proposal No. 273 for the lease or purchase of a remote job entry station with a minimum 18 data entry stations to operate as a HASP multi-leaving RJE with concurrent data entry capabilities.
Request for Proposal No. 274 for the lease or purchase of a minicomputer system to be used in the instruction of a computer sciences program at a small university.
Request for a Proposal No. 275 for the purchase of an alphanumeric keyboard, a plotter and T-connector to attach to a Wang 600 programmable calculator.

Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities.
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Adapso Active on Many Fronts, Sees '77 as Time of Response

By a CW Staff Writer

MONTVALE, N.J. – The Association of Data Processing Service Organizations (Adapso) is moving on many fronts to represent the interests of its members.

Incoming President Lou Pfeiffer recently told the association its goal in 1977 should be to respond to changes.

Pfeiffer said he intends to tell the world the data services industry is not a fledgling industry, but one that is growing and here to stay.

Adapso committees are active on issues ranging from electronic funds transfer (EFT) systems to taxation and software protection.

In the EFT area, committee chairman William Fletcher indicated the Adapso stand will encompass the issues of network switching, whether the switch operator is permitted to also engage in data processing and if the switch should be regulated.

Fletcher's primary concern is the possible intrusion of banks into the DP services area through EFT, he said.

Alan Rievman, chairman of Adapso's tax committee, told the group 1976 was a year of "dramatic tax problems" for the data services industry. The biggest single problem, he added, was retroactive assessment.

"If states prevail [in retroactive assessment], they will likely threaten the existence of the data services industry," he warned.

Adapso has retained a law firm for advice and counsel on how to proceed in various states. Lawyers have advised software firms to collect sales taxes on products sold in New York State, he said.

Werner Pleus said the Privacy and Security Committee has three aims: policy, education and liaison with government committees.

The committee is issuing to members a draft of security guidelines and soliciting comments.

The Data Centers group has had a local market research kit prepared which it distributed free to Adapso members. The kit, prepared with the help of International Data Corp., was designed to give the individual data center manager the tools with which to conduct market research in his locality.

The Manufacturers Relations Committee, headed by Bruce Coleman of Boole & Babbage, Inc., worked more closely with IBM in several areas during the past year, according to Jerry Dreyer, Adapso's executive director.

Coleman explained that when an Adapso member feels action by IBM people in the field deviates from an IBM policy, such as excessively long trial installations, the committee discusses the matter with IBM.

In addition, the group acts as a liaison with IBM when Adapso members, often not users of IBM machines, see the need for fixes in new software releases.

Year-End Cheer at HP

PALO ALTO, Calif. – 'Tis the season. Hewlett-Packard Co. (HP) distributed about $13.6 million to more than 27,500 employees under its cash profit-sharing plan.

This raised the total disbursement for 1976 to more than $23.2 million, the largest ever, compared with $21.4 million in 1975.

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Intel 8085 Offers 50% Improvement Over 8080

SANTA CLARA, Calif. – Intel Corp.'s 8085 microcomputer system is object code-compatible with 8080A and bus-compatible with 8080 components, but offers up to or more than 50% improvement in price/performance, according to the firm.

Only three chips are needed to build a complete system rather than 10 or more 8080 system components, the firm said.

Operating rate with standard-speed memory is 3mHz instead of the 8080's 2mHz. Throughput can be increased more than 50% in some applications by using new features.

The 8085 operates on a single ±5V supply for all components, including erasable programmable read-only memories; the 8080 requires three different voltages.

Typical instruction cycle time is 1.3 μsec, allowing the system to be used in high-performance applications ranging from controllers to 8-bit minis, the firm said.

Equipment manufacturers may intermix components of the 8080 and 8085 systems, according to Intel. However, the 8085 CPU and the 8080A are not pin-compatible.

A complete 8085 system may be built with the 8085 CPU; 8155 2K random-access memory, I/O and timer; 8355 16K read-only memory and I/O; or interchangeable 8755 16K erasable programmable read-only memory and I/O, Intel said.

Shipments in sample quantities are expected during the first quarter. Prices will be announced when available from stock, Intel said.

Microcosm

National Semi Unveils N-Channel Unit

SANTA CLARA, Calif. – National Semiconductor Corp.'s SC/MP-II microprocessor is an N-channel unit that is twice as fast and uses one-fourth as much power as the P-channel SC/MP 8-bit single-chip micro, the firm said.

The SC/MP-II operates off +5V, whereas the previous model required two power sources. Typical instruction execution time is 5 μsec and a microcycle is completed in 1 μsec, the firm said.

The unit is compatible with its predecessor in terms of pin configuration and object code. With slight modifications to the crystal frequencies, it will be compatible with all SC/MP support equipment, the firm indicated.

Sample quantities are available now at $17.76 each. Production quantities of more than 1,000 will cost about the same as the P-channel SC/MP, "significantly below $10 each," according to a spokesman.

National Semi is at 2900 Semiconductor Drive, Santa Clara, Calif. 95051.

Micro Mania

Fairchild, Motorola Sign Alternate Sources Pact

MOUNTAIN VIEW, Calif. – Fairchild Camera and Instrument Corp. and Motorola, Inc. have agreed to exchange technology and provide alternate sources of each other's micros.

Fairchild will manufacture and market Motorola's MC6800 microprocessor family, using photomasks and other aids from Motorola. It expects to begin shipments of 6800 components in the first quarter.

Fairchild will also produce Motorola's 8,000-bit ultraviolet erasable read-only memory and has an option to produce the MC10800 ECL 4-bit slice microprocessor family.

In return, Motorola will be an alternate source for Fairchild's family of low-power Schottky TTL logic and will have manufacturing rights for two Fairchild products under development – the one-chip F8 microcomputer and the 65,000-bit charge-coupled memory.

GI Licenses CP-1600 to ITT

NEW YORK – General Instrument Corp. (GI) has licensed International Telephone and Telegraph Corp. (ITT) to manufacture and sell its CP-1600 single-chip 16-bit microprocessor.

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Finding Trend Profitable

NCSS Focus on Market-Specific Services

NEW YORK — National CSS, Inc. (NCSS) is generating an increasing portion of its revenues from specific functional and industry applications, and President Robert E. Weissman expects the trend to continue.

Weissman feels NCSS can "compete successfully against IBM and others by supplying specific market segments with well-differentiated services," he said.

While basic time-sharing service accounted for 67.6% of 1974 revenues, it contributed only 53.2% in 1976 as application services rose from 25.5% in 1974 to 28.9% in 1976 and then to 34.2% in the first half of fiscal 1977, he told security analysts here recently.

Industry services' contribution to revenues has risen from 1.4% in 1974 to 7.8% in the first half of 1977, he added.

NCSS pruned its product line from over 150 to about 60 "so we could concentrate our resources and create real expertise in the problem areas these products address," Weissman explained.

The firm "is no longer just a time-sharing company. We are a marketing service company specializing in business information," he observed.

NCSS plans to leverage its data management system's capabilities by using it to develop specific problem-solution packages to address well-defined markets, such as its human resources management package, he said.

The firm has developed the capability of delivering a package of customer services which includes large computer expertise, sophisticated communications and applications software, he said.

Financial Picture Better

NCSS' financial picture has improved. During 1976, compared with year-ago quarters, earnings grew 8%, shrunk 2%, increased 30% and then rose another 39%.

The growth continued in the first quarter of fiscal 1977 with a 48% improvement.

With the market for information services estimated at $2 billion in 1980, Weissman said "that's a sufficiently large market in which to compete.

"Our success need not be tied to taking a significant piece of the marketplace away from IBM and we are comfortable that IBM is not going to take materially more than its current share of market — for political, economic, legal and organizational reasons," he said.

Braegen Expecting Profitable '77; Predicts Sales to Reach $8 Million

SAN FRANCISCO — Braegen Corp. expects to have its first profitable year next year thanks to the efforts of some dedicated ex-IBMers who believed in their product, according to Larry C. Edwards, vice-president of marketing.

The firm, which makes the Virtual Terminal System, suffered a setback in 1975 when California Computer Products, Inc. (Calcomp) pulled out of a commitment to buy it.

But that's all over, Edwards said. Braegen has secured new capital from European backers and is alive and kicking with about 50 employees now.

Although 1976 sales were in the range of about $2 million, Braegen expects to realize between $6 million and $8 million in sales during 1977, he said.

The product is what kept the firm alive, Edwards indicated. It is a minicomputer system with a family of associated peripheral devices that can act as a remote computer in a subserviant position to a host, in place of an IBM 3270, as a remote job entry system, as a data entry system or as a local job entry system in lieu of an IBM 1403, he said.

The system is firmly based on the concept of centralized DP equipment. But the user now wants to do some processing on data before handing it to the host, Edwards said.

The system differs from IBM's 3270 in that IBM offers a number of applications which stand alone in a partition and the user must decide which terminal to use for a specific application.

"We allow users with one terminal to go into each one of the partitions," Edwards noted; with multiple interfaces, users can switch between partitions.

The firm competes with all 3270-compatible manufacturers as well as Four Phase, Raytheon, Data 100 and, in some instances, mini makers such as Digital Equipment Corp. and Data General Corp., he added.

Braegen was founded in 1973 by a group of ex-IBMers and shortly "began to seek an OEM arrangement to supply the product and allow someone else to market it."

That someone was Calcomp, which signed an agreement to buy the firm and market the system in August 1974.

Braegen geared up production, had a backlog of systems and brought in 60 salespeople and managers to be trained on the system.

Then, in August 1975, Calcomp said it would not proceed with the agreement.

At that point Braegen had 250 employees and was shipping eight systems a month.

During the time between the layoffs and Braegen's rebirth, the system was enhanced and some manufacturing costs were reduced. Braegen was lucky because at the time of the "disaster" the firm was in the position to manufacture the systems and development behind it, Edwards said.

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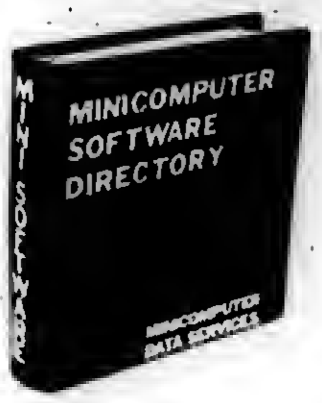

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- MVS experience highly desirable.
- Familiarity with OS internals essential.
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PROGRAMMER/ANALYSTS

- Strong IBM Assembler language background
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- Computer skills essential.
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These positions are located in Marathon's General Offices in Findlay, Ohio, and offer a salary commensurate with education and experience and a complete benefits package. Principals only, no agencies.

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PROGRAMMERS

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data processing

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- Experience in the design and development of data communications systems with exposure to the concepts and application of data communications as applied to IBM 370 systems
- Thorough knowledge of Assembler Language and Job Control Language for an IBM environment
- Oriented toward solution of problems using a project planning approach

Sr. Software Specialist - OS/VS1

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- Formal training in IBM OS/VS1 internals or equivalent
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- Experience in working with VSAM and SMP

Sr. Software Analyst - IMS/VS

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Closing date for applications: February 15, 1977. Please reply to:

Robert S. Morrissey
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Ad. 135
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Oneonta, N.Y. 13820

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Send resume establishing qualifications, full employment and earnings history, and salary requirements to Kenneth R. Logan.

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We invite applications for COORDINATOR OF EDUCATIONAL COMPUTER SERVICES involving coordination of academic computer usage, writing user manuals, organizing seminars, and consulting with faculty. All qualified candidates will be considered with preference to Masters degrees in Computer Science and experience on the Burroughs 6700 system. Yearly salary is $13,000 to $16,000 depending upon qualifications.

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Forward resume outlining salary requirements to Douglas B. D'Agata, Digital Equipment Corporation, 200 Forest Street, Marlboro, Massachusetts 01752.

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POSITION - Data Processing Project Manager

LOCATION - Alameda County, Oakland, CA, District Attorney's Office

THE PROJECT - To convert an existing staff management resource system from a Singer computer system and implement Automated Legal Research.

MINIMUM QUALIFICATIONS - Seven years DP experience in development and implementation of computer systems.

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(1) Project Management experience
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(4) Computer-to-Computer conversions experience
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APPLY BY - January 31, 1977

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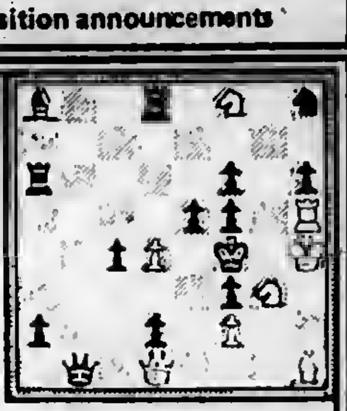

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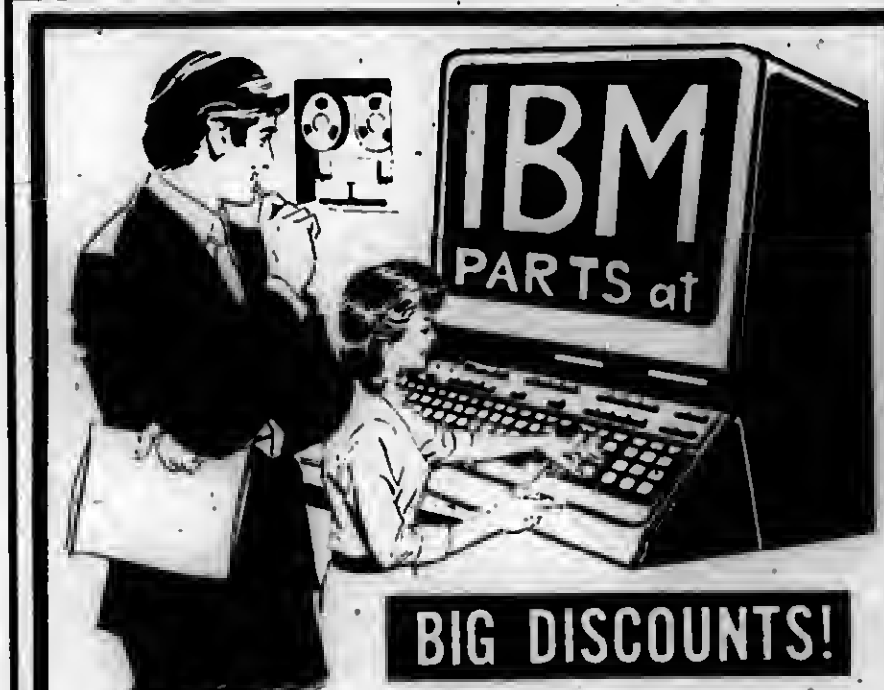

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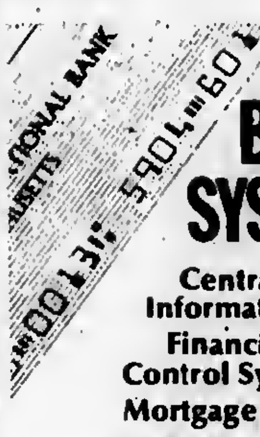

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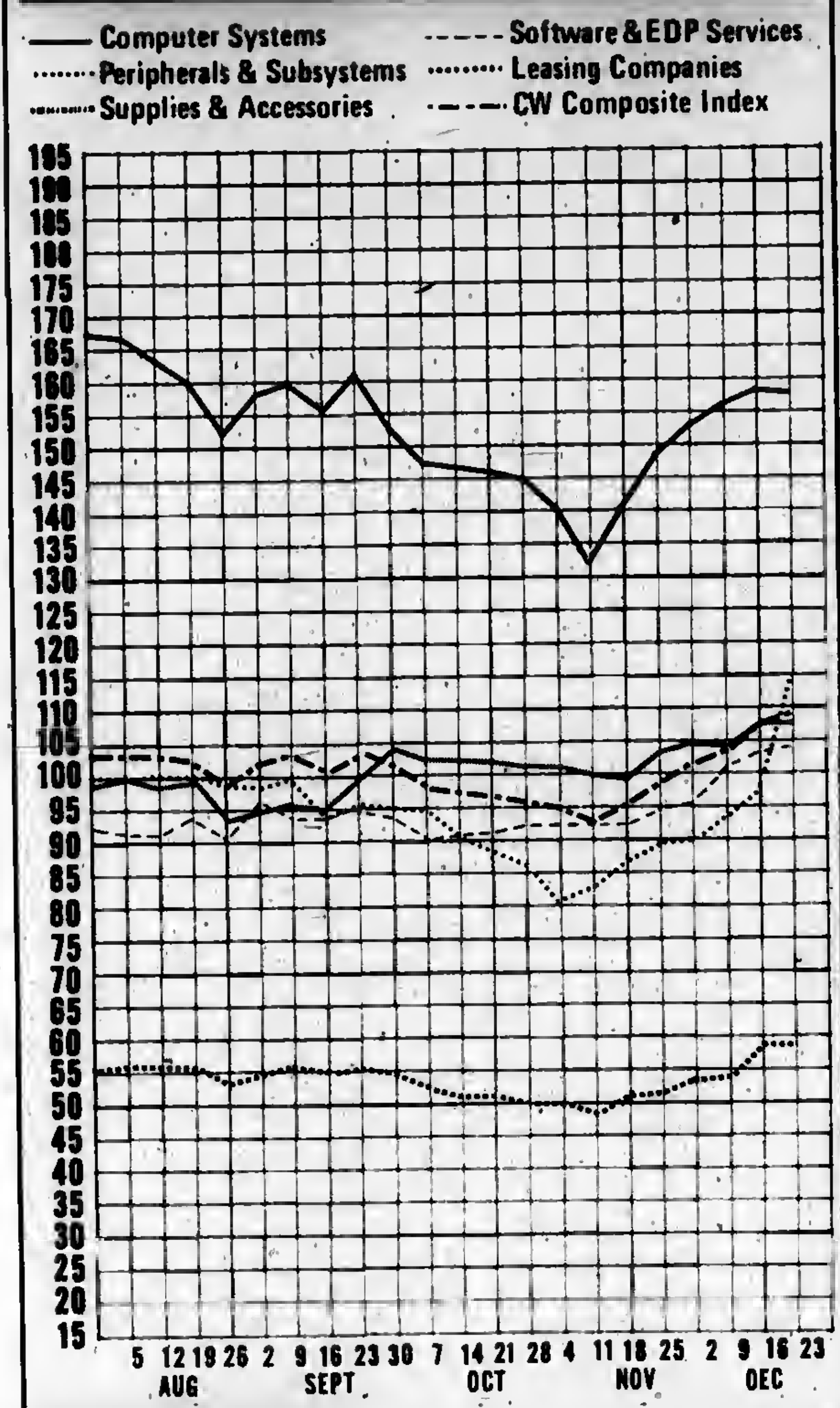
COMPUTERWORLD Computer Stocks Trading Indexes



Earnings Reports

FAIRCHILD INDUSTRIES

Three Months Ended Sept.30

	1976	1975
Shr Ernd	$.28	$.11
Revenue	61,319,000	47,909,000
Earnings	1,300,000	476,000
9 Mo Shr	.72	.44
Revenue	179,274,000	161,968,000
Earnings	3,311,000	2,003,000

INTEL

Three Months Ended Sept. 30

	1976	1975
Shr Ernd	$.63	s.42
Revenue	61,879,000	34,669,000
Earnings	6,781,000	4,370,000
9 Mo Shr	1.62	s1.13
Revenue	157,987,000	96,535,000
Earnings	17,258,000	11,878,000

s-Adjusted for 50% stock dividend paid in May.

LOGICON

Three Months Ended Sept. 30

	1976	1975
Shr Ernd	$.32	$.24
Revenue	7,083,000	6,589,000
Earnings	278,000	208,000
6 Mo Shr	.58	.47
Revenue	13,864,000	13,362,000
Earnings	501,000	402,000

MSI DATA

Three Months Ended Sept. 30

	1976	1975
Shr Ernd	$.34	.....
Revenue	8,342,919	$7,175,220
Disc Op	.....	(1,421,598)
Earnings	872,299	(1,341,316)
6 Mo Shr	.66	.....
Revenue	16,978,952	15,427,894
Disc Op	.....	(1,564,354)
Earnings	1,298,643	(1,122,072)

RELIANCE GROUP

Three Months Ended Sept. 30

	1976	a1975
Shr Ernd	$1.59	.....
Disc Op	.....	($7,187,000)
Spec Cred	b1,131,000	d(5,263,000)
Earnings	13,569,000	(13,780,000)
9 Mo Shr	2.52	.....
Disc Op	.....	(8,082,000)
Spec Cred	b4,106,000	d(2,718,000)
Earnings	23,666,000	(16,478,000)

a-Restated for foreign currency translation. b-Tax loss carryforward. d-From early extinguishment of debt.

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, DECEMBER 22, 1976

All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02138

COMPUTER SYSTEMS

EXCH		PRICE			
		1976 RANGE (1)	CLOSE DEC 22 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	AMDAHL CORP	23- 39	39	+2 3/4	+7.5
N	BURROUGHS CORP	84-108	88 1/2	+1 1/8	+1.2
O	COMPUTER AUTOMATION	10- 19	18 3/4	+1 3/4	+10.2
N	CONTROL DATA CORP	18- 27	25 1/4	- 1/8	-0.4
N	DATA GENERAL CORP	40- 60	42 3/4	- 3/4	-1.7
O	DATAPOINT CORP	24- 46	28 1/2	0	0.0
O	DIGITAL COMP CONTROL	2- 7	6 1/2	+ 1/4	+4.0
N	DIGITAL EQUIPMENT	46- 60	53 1/4	+ 1/4	+0.4
N	ELECTRONIC ASSOC.	2- 5	2 1/4	0	0.0
A	ELECTRONIC ENGINEER.	7- 16	8	- 1/4	-3.0
O	FOUR-PHASE SYSTEMS	13- 21	14 3/4	-1 5/8	-9.9
N	FOXBORO	28- 51	49	- 7/8	-1.7
O	GENERAL AUTOMATION	4- 11	8 1/8	+1 1/8	+16.0
O	GPI COMPUTER CORP	1- 1	1/2	0	0.0
N	HEWLETT-PACKARD CO	80-117	83 7/8	-2 7/8	-3.3
N	HONEYWELL INC	34- 56	46	- 1/8	-0.2
N	IBM	227-288	270 1/4	+1 1/2	+0.5
O	MANAGEMENT ASSIST	1- 9	7 1/2	- 1/8	-1.6
O	MEMOREX	17- 33	23 3/8	- 3/8	-1.5
O	MICRODATA CORP	10- 28	17 5/8	+ 3/4	+4.4
O	MODULAR COMPUTER SYS	3- 14	4 7/8	- 3/8	-7.1
N	NCR	24- 37	35 1/2	- 5/8	-1.7
O	PRIME COMPUTER INC	4- 18	16 3/4	- 1/2	-2.8
N	PERKIN-ELMER	19- 27	20	+ 3/8	+1.9
N	RAYTHEON CO	45- 67	59 5/8	-1 1/2	-2.4
N	SPERRY RAND	40- 52	43 1/8	-2 7/8	-6.2
O	SYCOR INC	9- 31	12 1/4	- 3/4	-5.7
A	SYSTEMS ENG. LABS	5- 10	6	0	0.0
N	VARIAN ASSOCIATES	12- 17	13 7/8	- 1/8	-0.8
A	WANG LABS.	11- 20	14	- 3/8	-2.6

LEASING COMPANIES

EXCH		1976 RANGE (1)	CLOSE DEC 22 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	BOOTHE COMPUTER CORP	1- 8	7 5/8	+ 1/8	+1.6
O	COMDISCO INC	3- 10	9	- 1/4	-2.7
A	COMMERCE GROUP CORP	2- 3	1 5/8	- 1/8	-7.1
A	COMPUTER INVSTRS GRP	1- 3	1 1/2	- 3/8	-20.0
M	DATRONIC RENTAL	1- 8	1 1/8	+ 1/8	+12.5
A	DCL INC	1- 1	3/4	- 1/8	-18.6
N	DPF INC	5- 9	6 5/8	- 1/2	-7.0
N	ITEL	6- 15	12	-1	-7.6
N	LEASCO CORP	6- 20	18	- 3/8	-2.0
O	LEASPAC CORP	0- 1	1/2	+ 3/8	+300.0
O	NPG INC	0- 1	1/8	0	0.0
A	PIONEER TEX CORP	6- 9	7 3/8	- 1/8	-1.6
N	U.S. LEASING	7- 12	10 1/4	+ 1/8	+1.2

EXCH: N=NEW YORK; A=AMERICAN; R=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

SOFTWARE & EDP SERVICES

EXCH		1976 RANGE (1)	CLOSE DEC 22 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 3	1 3/4	+ 5/8	+55.5
O	ANACOMP INC	6- 11	6 7/8	+ 1/4	+3.7
A	APPLIED DATA RES.	2- 5	4 3/4	- 1/4	-5.0
N	AUTOMATIC DATA PROC	17- 35	28	-1 7/8	-6.2
O	COLEMAN AMERICAN COS	2- 6	2 1/4	- 1/8	-5.2
O	COMPU-SERV NETWORK	3- 10	8 3/4	+ 1/2	+6.0
O	COMPUTER DIMENSIONS	3- 7	6 7/8	0	0.0
O	COMP ELECTION SYSTMS	5- 9	5 1/2	0	0.0
O	COMPUTER HORIZONS	1- 2	1 1/4	0	0.0
O	COMPUTER NETWORK	2- 8	6 1/4	- 1/8	-1.9
N	COMPUTER SCIENCES	4- 8	7	0	0.0
O	COMPUTER TASK GROUP	1- 2	1 1/4	0	0.0
O	COMPUTER USAGE	2- 6	2 1/4	- 1/4	-10.0
O	COMSHARE	2- 9	5 1/2	0	0.0
O	DATA DIMENSIONS INC	2- 5	4 7/8	- 1/4	-4.8
O	DATATAB	1- 2	1 3/8	- 1/8	-8.3
N	ELECTRONIC DATA SYS.	12- 18	16 1/4	- 1/4	-1.5
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	INSYTE CORP	1- 3	2 1/8	- 1/2	-19.0
O	IPS COMPUTER MARKET.	1- 2	1	0	0.0
O	KEANE ASSOCIATES	2- 4	2 3/8	+ 1/4	+11.7
O	KEYDATA CORP	1- 5	1 1/2	- 1/8	-7.6
O	LOGICON	3- 8	7 1/2	+ 1/8	+1.6
A	MANAGEMENT DATA	1- 3	2	0	0.0
A	NATIONAL CSS INC	13- 25	23 1/2	+ 1/2	+2.1
O	NATIONAL DATA CORP	4- 7	5 1/8	+ 1/4	+5.1
A	ON LINE SYSTEMS INC	17- 23	22	+ 1/8	+0.5
N	PLANNING RESEARCH	3- 5	3 5/8	0	0.0
O	PROGRAMMING & SYS	1- 1	1/4	0	0.0
O	RAPIDATA INC	2- 5	2 1/8	0	0.0
O	REYNOLDS & REYNOLDS	13- 21	18 3/4	+1	+5.6
O	SCIENTIFIC COMPUTERS	1- 1	7/8	0	0.0
O	TYMSHARE INC	14- 25	18 3/4	+1	+5.6
A	UPS SYSTEMS	3- 5	3 7/8	0	0.0
N	WYLY CORP	1- 7	1 5/8	0	0.0

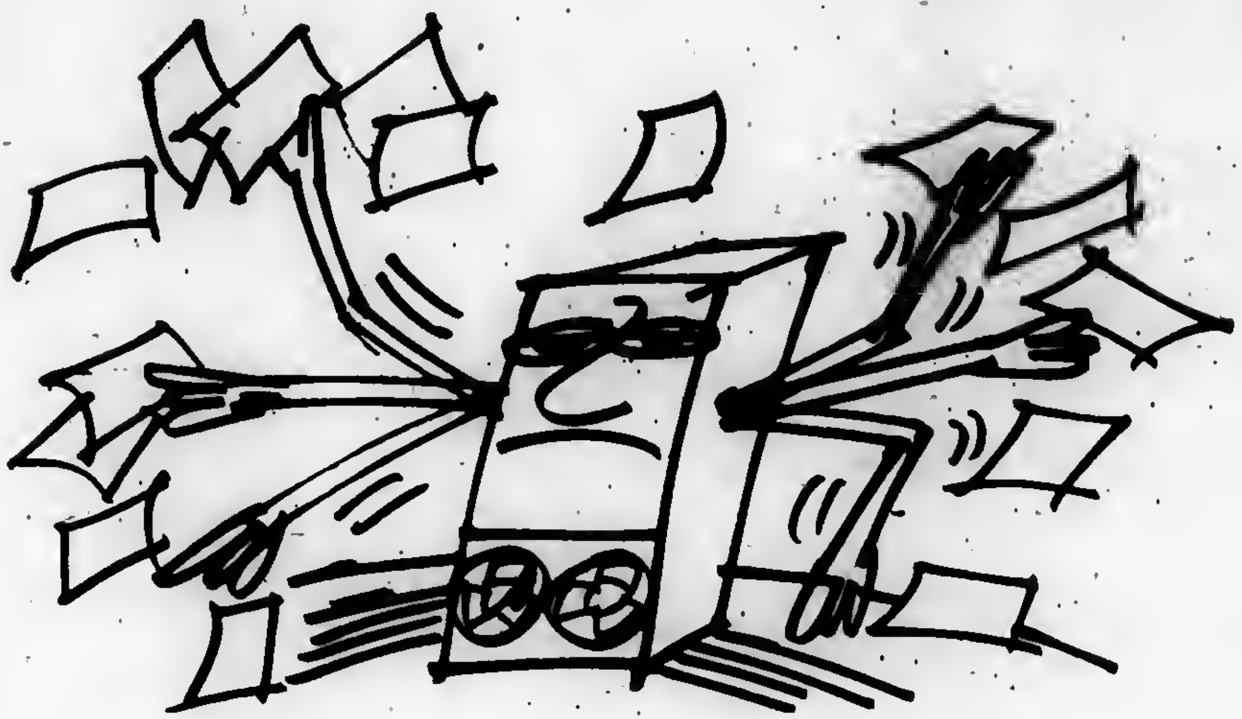
PERIPHERALS & SUBSYSTEMS

EXCH		1976 RANGE (1)	CLOSE DEC 22 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	8- 13	12 5/8	+ 3/8	+3.0
O	ADVANCED MEMORY SYS	4- 10	8 1/8	+ 3/8	+4.8
N	AMPEX CORP	5- 10	7 3/4	+ 1/2	+6.8
O	ANDERSON JACOBSON	2- 4	3	0	0.0
O	APPLIED DIG DATA SYS	13- 25	16	0	0.0
O	BEEHIVE MEDICAL ELEC	3- 11	10	- 7/8	-8.0
A	BOLT, BERANEK & NEW	7- 11	7 1/8	0	0.0
N	BUNKER-RAMO	5- 10	8 3/4	0	0.0
A	CALCOMP	4- 7	4 1/8	- 1/8	-2.9
O	CAMBRIDGE MEMORIES	0- 6	3/4	+	+8.3
N	CENTRONICS DATA COMP	20- 36	26 7/8	+ 7/8	+3.3
O	CODEX CORP	22- 42	31	0	0.0
O	COGNITRONICS	1- 1	3/4	- 1/8	-14.2
O	COMPUTER COMMUN.	1- 6	4 3/8	- 1/8	-2.7
O	COMPUTER CONSOLES	4- 7	5	- 1/2	-9.0
A	COMPUTER EQUIPMENT	1- 3	1 3/4	- 1/8	-6.6
O	COMPUTER TRANSCEIVER	1- 3	5/8	0	0.0
O	CONTEN	4- 10	9 5/8	- 1/8	-1.2
N	CONRAC CORP	20- 27	25 3/4	- 7/8	-3.2
O	DATA ACCESS SYSTEMS	1- 5	4 1/4	0	0.0
O	DATA 100	6- 13	7 3/8	- 3/8	-4.8
A	DATA PRODUCTS CORP	5- 15	11 5/8	- 5/8	-5.1
O	DATA TECHNOLOGY	1- 3	3 3/8	+1	+42.1
O	DATUM INC	1- 2	1 1/8	- 1/8	-10.0
O	DECISION DATA COMPUT.	1- 4	2	0	0.0
O	DELTA DATA SYSTEMS	1- 1	3/8	- 1/8	-25.0
N	ELECTRONIC M & M	1- 4	3 5/8	+ 3/8	+11.5
O	FABRI-TEK	1- 1	3/4	-	-7.7
O	GENERAL COMPUTER SYS	0- 2	1/2	+ 1/8	+33.3
N	HAZELTINE CORP	4- 12	9 1/8	- 1/4	-2.6
N	HARRIS CORP	34- 57	56 3/8	- 7/8	-1.5
A	INCOTERM CORP	9- 20	12 3/8	- 3/8	-2.9
O	INFOREX INC	3- 7	5 3/4	+ 3/8	+6.9
O	INFORMATION INTL INC	10- 18	13	+1 1/8	+9.4
O	INTEL CORP	47-109	56	+1 1/2	+2.7
A	LUNDY ELECTRONICS	3- 7	3 5/8	- 1/4	-6.4
O	MSI DATA CORP	3- 7	6 3/4	+ 3/8	+5.8
N	MILGO ELECTRONICS	15- 22	20 3/4	- 1/2	-2.3
N	MOHAWK DATA SCI	3- 10	6 1/8	0	0.0
O	RENRIL CORP	1- 3	2	0	0.0
A	PERTEC CORP	3- 8	7	+ 1/8	+1.8
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	2- 10	1 1/2	0	0.0
O	QUANTOR CORP	4- 6	5 1/8	0	0.0
O	RECOGNITION EQUIP	6- 11	9 7/8	0	0.0
N	SANDERS ASSOCIATES	6- 11	9 1/2	- 3/4	-7.3
O	SCAN DATA	1- 4	1 3/8	+	+4.7
O	STORAGE TECHNOLOGY	9- 13	10 5/8	- 1/2	-4.4
O	T BAR INC	5- 10	6 7/8	- 1/8	-1.7
O	TALLY CORP.	4- 6	5 7/8	0	0.0
O	TEC INC	3- 9	9	0	0.0
N	TEKTRONIX INC	45- 69	63 3/4	-1 1/2	-2.2
N	TELEX	2- 5	2 1/2	- 1/8	-4.7
O	WANGCO INC	11- 22	18	0	0.0
O	WILTEK INC	2- 2	3/4	+ 1/4	+50.0

SUPPLIES & ACCESSORIES

EXCH		1976 RANGE (1)	CLOSE DEC 22 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED SYSTEMS INC	1- 4	3 1/4	0	0.0
O	BALTIMORE BUS FORMS	3- 5	3 1/4	0	0.0
A	BARRY WRIGHT	6- 11	11	+1 3/8	+14.2
O	CYBERMATICS INC	0- 1	1/2	0	0.0
A	DATA DOCUMENTS	25- 45	45	0	0.0
O	DUPLEX PRODUCTS INC	13- 24	13 1/2	- 1/4	-1.8
N	ENNIS BUS. FORMS	6- 8	5 7/8	0	0.0
O	GRAHAM MAGNETICS	8- 13	10	0	0.0
O	GRAPHIC CONTROLS	13- 19	14 3/4	- 1/4	-1.6
N	3M COMPANY	53- 66	56 1/8	+ 3/8	+0.6
O	MOORE CORP LTD	32- 51	35 1/4	+1 1/2	+4.4
N	NASHUA CORP	11- 20	18 1/2	- 3/4	-3.8
O	STANDARD REGISTER	15- 19	18 1/2	+ 1/4	+1.3
O	TAB PRODUCTS CO	5- 12	11 1/2	+ 1/2	+4.5
N	UARCO	19- 25	21 1/2	+ 3/8	+1.7
A	WABASH MAGNETICS	4- 11	10 1/4	- 5/8	-5.7
N	WALLACE BUS FORMS	19- 25	20 5/8	- 5/8	-2.9

Does your IBM host computer do too much telecommunications housekeeping and not enough computing?



Introducing Flexicom's IBM-compatible telecommunications system. With clean, quick, simple host interfacing.

If your company is using a communications network, your host computer's applications growth is limited because of expanding workloads and lack of sufficient support.

The consequences?—Escalating staff and equipment problems. And, of course, the bottom line is increasing costs for your data processing system.

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Consistent Systems Architecture.

Flexicom's software frees your host computer of telecommunications housekeeping by organizing the network and placing tasks where they belong—with Flexicom. That's because it operates as a front-end *or* distributed processor.

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This means only minimal user programming is necessary to integrate Flexicom with your host computer.

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Flexicom is an inexpensive, long-term solution to data communications problems.

IBM hardware in a telecommunications system that's basically an IBM solution means little training will be required of your staff. Consistent Systems Architecture means future needs will be readily accommodated as they develop. Fewer problems with more efficient equipment means a more productive staff.

And your host computer will be free to do the basic bottom line work.

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- Extensive network control statistics.
- Message switching.

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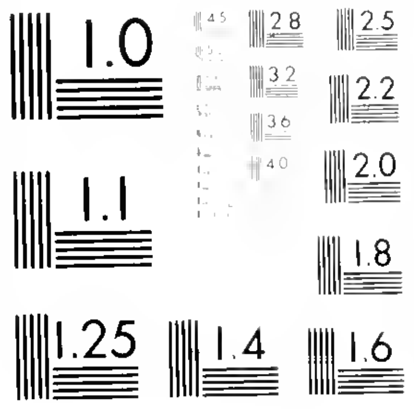
RESOLUTION CHART



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

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100 MILLIMETERS

INSTRUCTIONS Resolution is expressed in terms of the lines per millimeter recorded by a particular film under specified conditions. Numerals in chart indicate the number of lines per millimeter in adjacent "T-shaped" groupings.

In microfilming, it is necessary to determine the reduction ratio and multiply the number of lines in the chart by this value to find the number of lines recorded by the film. As an aid in determining the reduction ratio, the line above is 100 millimeters in length. Measuring this line in the film image and dividing the length into 100 gives the reduction ratio. Example: the line is 20 mm. long in the film image, and 100 ÷ 20 = 5.

Examine "T-shaped" line groupings in the film with microscope, and note the number adjacent to finest lines recorded sharply and distinctly. Multiply this number by the reduction factor to obtain resolving power in lines per millimeter. Example: 7.9 group of lines is clearly recorded while lines in the 10.0 group are not distinctly separated. Reduction ratio is 5, and 7.9 x 5 = 39.5 lines per millimeter recorded satisfactorily. 10.0 x 5 = 50 lines per millimeter which are not recorded satisfactorily. Under the particular conditions, maximum resolution is between 39.5 and 50 lines per millimeter.

Resolution, as measured on the film, is a test of the entire photographic system, including lens, exposure, processing, and other factors. These rarely utilize maximum resolution of the film. Vibrations during exposure, lack of critical focus, and exposures yielding very dense negatives are to be avoided.

THE END